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ABSTRACT

This report of the EISO project, the responsibility of which is the operation of an online bibliographic search service for educators of Ontario, concentrates on research findings collected after EISO had been operational for 16 months. The organization, role, and level of satisfaction of EISO users are treated, the system's impact on a school board in the Northeastern region of Ontario is outlined, and the economics of operating an online bibliographic retrieval and duplication service are assessed. A state-of-the-art review of the ERIC data base search services in Canada is also included, as well as a discussion of alternative organizational structures for EISO. Appendices include samples of the evaluation questionnaire used to collect data on users, the pamphlet and brochure publicizing EISO, and order forms for copies of original materials. (Author/MBR)

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EDUCATIONAL INFORMATION SYSTEM FOR ONTARIO

Second Interim Report

March 1976 - February 1977

Stephen B. Lawton
Ethel Auster

The Ontario Institute for Studies in Education

IR006634

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

THIS RESEARCH PROJECT FUNDED UNDER CONTRACT
BY THE MINISTRY OF EDUCATION, ONTARIO

ABSTRACT

Early in 1975, the Ontario Ministry of Education contracted with The Ontario Institute for Studies in Education to undertake a research project to examine the viability of operating an on-line bibliographic search service for the educators of the province. The project was to study, among others, the nature and levels of demand in Ontario for such a service; to develop and refine methods of placing search orders, order delivery, and advertising; to determine manpower, technical requirements and fiscal viability; and to assess the effectiveness of an intermediary in interacting with users in a remote geographic setting in Northern Ontario.

The earliest phases of the project involved implementation of the search service. Access to the data bases maintained by System Development Corporation and Lockheed, both in California, was provided by a terminal located in the OISE Library. Copies of documents cited in computer-generated bibliographies were made available for requestors in microfiche or hard copy formats. Educational Information Consultants were trained to help clarify and negotiate requests from users in the North Bay area of Ontario. These efforts were the subject of the first *Interim Report* covering the period March 1975 - February 1976. That report concentrated on the early phases of the project: the relevant literature was reviewed, the conceptual framework used to collect and analyze the data was described, the early phases of the implementation of the search service were detailed, and preliminary findings were presented.

While developmental and theoretical aspects received most emphasis in the first annual report, this *Second Interim Report* concentrates on the research findings collected after the search service had been in operation 16 months. The organization, role, and level of satisfaction of EISO users are treated; the impact of EISO on a school board in the

Northeastern Region of Ontario is outlined; the economics of operating an on-line bibliographic retrieval and duplication service is assessed. A state-of-the-art review of ERIC data base search services in Canada constitutes Chapter 6 while the final chapter considers alternative organizational structures for EISO. Appendices reproduce samples of the evaluation questionnaire used to collect data on users, the pamphlet and brochure publicizing the EISO service, and order forms for copies of original materials.

ACKNOWLEDGEMENTS

While much of the first year of operation for the Educational Information System was devoted to the developmental aspects of the project, the second year concentrated on creating a broader awareness of the service among Ontario educators, modifying and refining the provision of on-line bibliographic retrieval services, and collecting and analyzing research data. These activities, and others, made heavy demands on the EISO staff. The Principal Investigators would like to acknowledge in particular Ruth von Fuchs, Search Analyst, who not only served hundreds of clients with unfailing courtesy and skill, but allowed all her actions to be subjected to intense scrutiny. Few could have borne the shifting, often unexplained, demands of the researchers with such grace. We also appreciate the efforts of David To, Graduate Assistant, who interviewed numerous clients with admirable patience and persistence. Ann Yeung, Library Assistant, again typed, maintained records, duplicated microfiche and, in addition to all her other tasks, coded and key-punched questionnaire data with unfailing accuracy.

The cooperation and support given the project by units of The Ontario Institute for Studies in Education and personnel of the Ministry of Education for the Province of Ontario are again gratefully acknowledged. We particularly appreciate the undiminished interest and commitment of the Educational Information Consultants who have enabled the EISO project to make a significant impact on the Northeastern Region of this province. To the many clients all over Ontario who used EISO, and especially to those who returned evaluation questionnaires and granted interviews, we are also grateful.

Finally, we would like to thank Uwe Piekert for designing the cover and Margaret McCabe for typing this report.

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CHAPTER 1

Introduction

In 1975, against a background of rapid development in the field of information science, the Ontario Ministry of Education funded a contract titled the Educational Information System for Ontario (EISO) to develop, evaluate, and analyze an information dissemination system based upon computerized retrieval of bibliographies. EISO has now been in operation for a year and a half, providing both a search service that locates references to literature on a multitude of educational topics, and a duplication service that provides copies of original materials located by the service.

EISO's first *Interim Report*, submitted in March 1976, recounted the creation of EISO, its basis in theory and practice, and an initial assessment of its effectiveness. This report, building on the previous one, undertakes a detailed analysis of the types of individuals who have used EISO, their levels of satisfaction with the service, the service's impact on their organizations, and the economics of operation. After a survey of the development of on-line information services in Canada, the report concludes with an outline of organizational structures that might be used if EISO is to become a permanent service.

Prior to the creation of the Educational Information System for Ontario, no computer-based, on-line bibliographic search service aimed primarily at educators existed in this province. Nor did there at that time exist a data base consisting of entirely Canadian educational materials or documents. Obviously, then, if serious study was to be undertaken preliminary to the possible creation of any such provincial or national system, at least two areas would have to be explored and data collected and analyzed before any further progress could be made. One of these areas was the technical requirements and feasibility of creating an Ontario data base of educational information. To examine this highly

complex aspect of information storage and retrieval, the Ontario Ministry of Education contracted with the Metropolitan School Board of Toronto to undertake a project entitled Ontario Educational Research Information System (ONTERIS). To look into the questions of dissemination and utilization of information, the Ministry funded EISO.

EISO set up a fully operational information service offering an interactive on-line bibliographic search service to the educators of this province first by providing them access to the existing Educational Resources Information Centre (ERIC) data base, and later to other data bases such as *Psychological Abstracts*, *Exceptional Child Education Abstracts*, *Social Sciences Citation Index*, *Sociological Abstracts*, and other data bases relevant to educators. From the very first, then, EISO differed from the usual research contract in that it was not only to provide a rigorous research study firmly grounded in theoretical concepts, but it was also to have a large developmental component in the implementation of a search service available to educators on a fee-paying basis. Thus, not only were normal aspects of contract research such as research design, data collection and analysis required, but also some more unusual activities. Among these were creation of a business system, a set of publicity materials, and a program for training Educational Information Consultants who were to act as information intermediaries in geographically remote areas. Professional development activities, seminars, workshops, and demonstrations added still other aspects to the study.

To use the search service EISO provides, the educator submits his information request to the search analyst, a specially trained reference librarian, who rewords the content to conform to a list of subject headings designed for computer scanning of the appropriate data base. The search analyst queries the bibliographic data base using either of two search systems, Lockheed Information System (LIS)'s DIALOG or System Development Corporation (SDC)'s ORBIT. When combinations of subject headings are entered, the number of relevant citations and sample citations are printed on-line. If the citations are appropriate, the complete bibliography is printed off-line and mailed to the requestor.

Should the client wish to obtain copies of the original documents cited in the bibliography he may order ERIC documents available on microfiches and paper copies of journal articles from EISO. Paper prints from ERIC fiche are available from the ERIC Document Reproduction Service in the United States.

To evaluate EISO, an Information System Model was designed which focused on the system's inputs, processes and outputs. The primary inputs were identified as the user, who is characterized by social traits such as his position, age, education; the search analyst; and the computer system. The process phase included question negotiation, reference retrieval, document retrieval and knowledge of acquisition. The major output variable of concern was the user's satisfaction with the service. By analyzing various combinations of inputs and processes, it was hoped that factors affecting satisfaction could be identified, so that improvements could be made in the system.

Since EISO was a new service, the evaluation took on an added complexity. It is widely recognized that individuals who try innovations tend to be a separate breed. Normally, innovators are male, well educated, and ambitious. Thus, in assessing the rate of adoption of EISO by educators, we focused on the demographic profiles of users to see if they fit the expected pattern. An adoption of an innovations model was used to plan the schedule of publicity and demonstrations. That is, it was recognized potential users had to go through five stages of adoption: awareness, search for more information, trial use, evaluation and a decision to adopt. Therefore, EISO committed great efforts during its first year at building awareness and providing free trial searches. If, as normally expected, adoption followed an S curve, then relatively few people would become regular users of EISO in its first year or two, but the number of users would climb rapidly thereafter.

Attraction of users would be relatively easy if EISO provided a free service; but it does not. A major focus, then, was the assessment of the relationship between price and demand. EISO also sought to establish its own true cost, so that realistic data would be available for setting prices and rates of subsidization in the future.

The work in EISO's first year formed the foundation for its accomplishments during the second year. The same basic model for assessing the service still applies, as does the focus on user satisfaction and the economics of operation. However, it is now possible to analyze the system in far greater detail than was the case one year ago.

CHAPTER 2

Organization and Role of the EISO User

EISO users come from all parts of the province, hold many different roles in many different organizations, and have different purposes in mind when requesting a bibliography from the Educational Information System for Ontario. This chapter describes various aspects of EISO's clientele, and compares their demographic profiles during the first and second year of the service. As in the first Interim Report, we use the distinction between the institutional or nomothetic dimension and the individual or idiographic dimension in order to group the variables that define the profiles, and assume that the two function together to help explain users' behaviour and their decision to use the system. Most data were collected via the EISO User Evaluation Questionnaire, which has been used throughout the study.

User Survey

Every user is sent an EISO User Evaluation Questionnaire about six weeks after a search has been completed and a bibliography sent. This questionnaire, the original version (or Version A) of which appears in Appendix C of the first Interim Report, was revised in the second year in order to refine its form, content and reliability. The new version (Appendix A) is about one-third shorter than the first version, and is typeset in the eight by eight inch format used for EISO printed materials. Version A was used from July 1, 1975 to March 31, 1976 and Version B has been used since then. In addition to both primary versions of the user evaluation questionnaires are two briefer questionnaires that have been prepared for sending to those users who do not return the longer versions. Finally, there are two EISO Service Evaluation Data Sheets (Appendix D of the first Interim Report, and Appendix B in this report) which are completed in-house

by the EISO search analyst and library assistant. As much data as possible are recorded on these data sheets in order to lessen the user's burden in supplying data needed for EISO's research and evaluation activities.

Rates of return for questionnaires have been quite satisfactory overall, though there is little data on some items, as the frequencies recorded in tables later reveal. In all, data for 387 of the 470 searches EISO conducted during its first year were assembled. That is, data are available on 83% of searches completed. Actual dates of "first year" searches, allowing for EISO's three month start-up period, span the period from July 1, 1975 to March 31, 1976. Data for second year searches are less complete. At the time of analysis, 119 evaluation questionnaires had been returned from among 283 that had been sent. These cover the period from April 1, 1976 to October 31, 1976. We expect this 42% return rate will improve as follow-up questionnaires are returned.

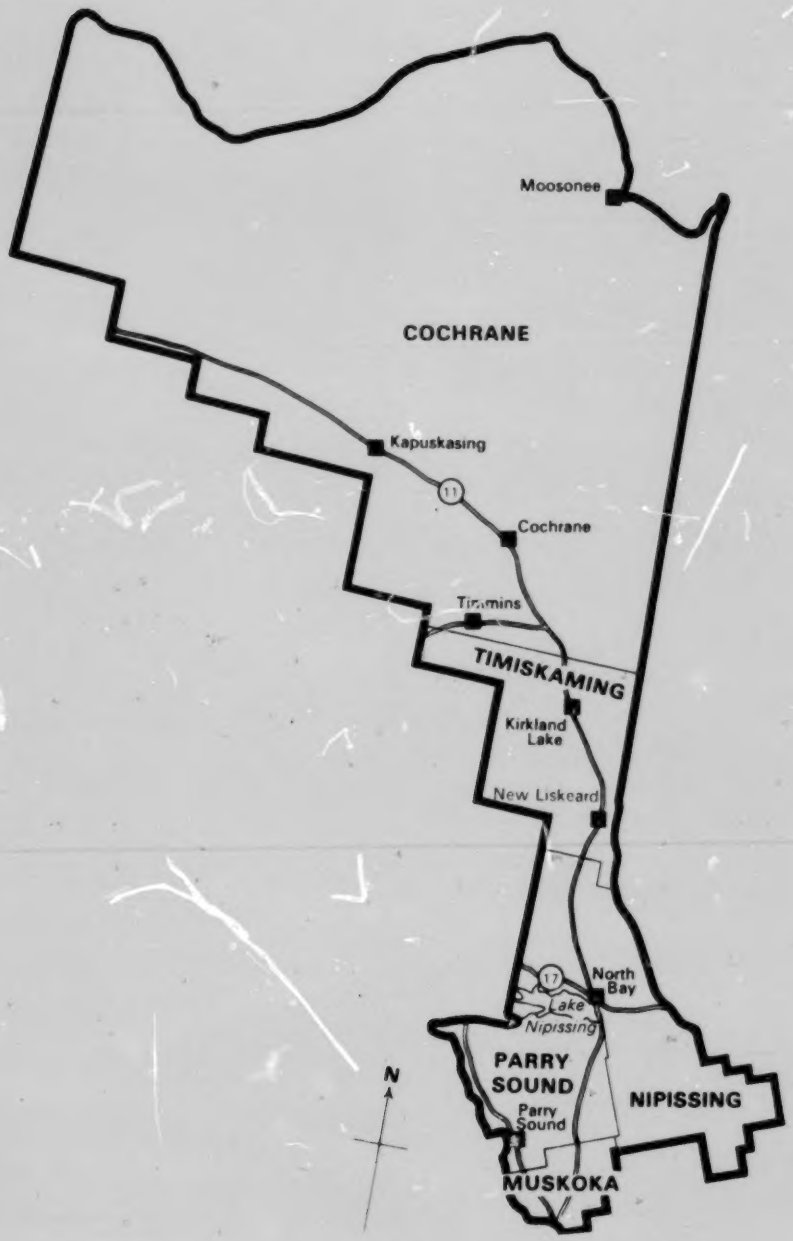
In making comparisons between data reported here for EISO's first year and those reported in the first year's Interim Report, the reader should note that more complete data are used in this version than were available previously. That report used a sample of 122 (similar to the data set being used in this report for second year data), while this report uses a sample of 387. Hence, discrepancies will occur between the two reports, discrepancies which should be decided in favour of the statistics given herein.

The description of the findings for the first two years of operations that follows begins by considering the organizational setting, followed by the organization itself and, finally, the individual role the user plays and several personal characteristics that may relate to the way that role is played.

Geographical Location of Users

In a province the size of Ontario, geography is often a major barrier to the provision of equitable services. Individuals and organizations in the larger urban areas have easy access to all types of commodities and services, including information. The same cannot be said for those located far from urban areas and from the population centres along Lake Ontario. One goal EISO has is to overcome these barriers with respect to the provision of information on educational topics. It took as its test area the Ministry of Education's Northeastern Region (Figure 1) which stretches from the Trent-Severn waterway to James Bay. In this region,

FIGURE 1 -- Northeastern Ontario Region (Districts of Cochrane, Nipissing, Parry Sound, Timiskaming, Muskoka)[1]



[1]Ontario Ministry of Education. *Directory of Education, 1975-76*, p. 116.

Educational Information Consultants were trained, numerous demonstrations were held, and EISO searches were provided at a reduced rate. In fact, each school board was provided one free search for every 1,000 students enrolled in the board. Thereafter, searches cost only $20, rather than $30 as elsewhere in the province.

EISO by no means limited its activity to the Northeastern Region. Demonstrations were conducted elsewhere, brochures were sent to all schools, and advertisements and articles appeared in professional journals. Yet, since greater efforts were made in the Northeastern Region, one would expect that if these efforts were effective, a disproportionately large number of search requests would have come from this region.

Table 1 reports the percentage of users from the Northeastern Region in EISO's first two years of operation. In both years, the region was

TABLE 1 -- USERS LOCATED IN NORTHEASTERN REGION (REGION 3)

Response	Percent	
	Year 1 (n = 380)	Year 2 (n = 119)
Yes	13.9	9.2
No	86.1	90.8

overrepresented, as had been expected. While it has only about 4% of the province's enrolment in elementary and secondary schools, over twice this percentage used the service in each of the two years. The decline in the second year, from 14% to 9% is in part due to the exhaustion of free searches. As will be noted in Table 2, several of the larger boards have used all of the free searches that have been allocated, and must now pay $20 for each one requested.

A broader look at the location of users and their organizations is taken in Table 3, where the province is broken down according to districts, counties or regions, and cities. It is particularly notable that Metropolitan Toronto, with about 23% of the school enrolment in the province, supplied over 50% of the users. This fact is of course explained by Toronto's preeminence in graduate education and educational research.

TABLE 2 -- ALLOCATION AND USE OF FREE SEARCHES IN NORTHEASTERN REGION

Organization	Free Searches		Paid Searches
	Allocated	Used	
Airy Township	2	0	0
Becknell Township	2	0	0
CFB North Bay	2	0	0
CFS Moosonee	2	0	0
Canfield Township	2	0	0
Canadore CAAT	5	2	0
Cochrane-Iroquois Falls	5	1	0
Cochrane-Iroquois Falls DRCSS	5	0	0
East Parry Sound	5	4	0
Hearst	5	4	0
Hearst DRCSS	5	0	0
Kapuskasing	5	3	0
Kapuskasing DRCSS	5	1	0
Kirkland Lake	5	5	0
Kirkland Lake DRCSS	5	5	0
Ministry of Education	5	4	0
Moose Factory Island	2	1	0
Moose No. 1 RCSS	2	0	0
Moosonee DSAB	2	0	0
Murchison and Lyell Township	2	0	0
Muskoka	8	3	0
Northern CAAT	5	5	3
OISE Field Centre	5	5	0
Nipissing	13	10	0
Nipissing Faculty of Education	5	2	0
Nipissing DRCSS	10	3	0
Pinard Township	2	0	0
Timmins	7	3	0
Timmins DRCSS	5	0	0
Timiskaming	6	2	0
West Parry Sound	5	3	0

TABLE 3 -- LOCATION OF USER'S ORGANIZATION

Location	Percent	
	Year 1 (n = 386)	Year 2 (n = 119)
District	14.8	7.6
County or Regional Government	23.3	24.4
Metropolitan Toronto	49.5	53.8
Ottawa	1.0	2.5
London	4.9	4.2
Hamilton	0.5	0
Windsor	2.6	0
Sudbury	1.3	5.0
Canada (not Ontario)	1.0	0.8
Not Canada	1.0	0

But more important, Table 3 reveals how the Toronto market is the mainstay of an educational information service. Alone, it probably can supply enough users to justify the capital and personnel expense of maintaining the service. This point is of importance later when we discuss the emergence of other educational information services in Ontario.

Another notable feature in Table 3 is the relative decrease in users in northern districts, which is probably explained by the decrease in usage in the Northeastern Region and the increase in usage in Ottawa and, particularly, Sudbury. Whether these changes will result in a longer term increase in these cities, we cannot say; the decline in use in Windsor shows that small percentages can change quickly. Worth investigating, in the latter case, is the possibility that users have been lured away to another search service, either in Windsor or in nearby Detroit.

In summary, EISO users come from all parts of the province, with about half from Metropolitan Toronto alone. Efforts to stimulate usage by giving free searches, training EICs, presenting workshops, etc. were effective in the Northeastern Region and will probably have a moderate continuing effect after free searches are exhausted and knowledge of the service has become commonplace.

EISO Users' Organizations

Organizational factors are probably more important than the geographical ones in explaining why a person requests a search, and paramount among these is the type of organization to which the user belongs and the purposes it has. Table 4 groups users according to twelve kinds of organizations. In its first year, school boards were EISO's top users, but their leadership in this has yielded to OISE in the second year. Overall, it is fair to say that on the average each of the two represents about 40% of the service's clientele. Usage by faculties of education has increased from 2.1% to 7.6%, while use elsewhere had tended to hold steady. The fact that faculties of education plus OISE now account for half of all users points to their fundamental position in justifying an educational information service. That is, they would appear to provide a sufficiently large clientele to justify the service's existence. Yet it is also clear that continuing efforts are needed to enlist users from boards. Unlike professors and graduate students, their day-to-day lives do not include use of a library. It is necessary for the library to go to them.

TABLE 4 -- ORGANIZATION OF PRIMARY ASSOCIATION

Organization	Percent			
	Year 1 (n = 380)		Year 2 (n = 119)	
Public Board	34.2	44.7	27.7	34.4
Separate Board	10.5		6.7	
Private School	0.8		0	
CAAT	4.7		3.4	
Faculty of Education	2.1		7.6	
OISE	30.8		41.2	
University	6.1		8.4	
Ministry of Education	3.7		2.5	
Professional Associations	0.8		0.8	
Government	1.8		0	
Business	1.8		0.8	
Other	2.6		0.8	

EISO users may be found playing numerous roles within their organizations, as can be seen in Table 5. Administration and teaching lead the

TABLE 5 -- PRIMARY PROFESSIONAL ROLE

Role	Percent			
	Year 1 (n = 245)		Year 2 (n = 119)	
Administration or Supervision	27.8		34.5	
Teaching	17.1		16.8	
Pupil Personnel	0.8		0.8	
Research	10.6		13.4	
Field Development	5.7		6.7	
Ministry Regional Office	3.3		0	
Library	6.9		7.6	
Private Consultant	2.4		2.5	
Undergraduate	0		0.8	
M.Ed. Student	3.3		0.8	
Ed.D. Student	4.9		3.4	
M.A. Student	3.7	21.7	1.7	13.5
Ph.D. Student	9.8		7.6	
Other	3.7		3.4	

list, followed by graduate work, field development, and librarianship. Most categories are very similar in their representation during the first and second years, except for a marked decrease in usage by graduate students. This decline is probably explained by the discontinuance of special programs to interest students: e.g., a reduced rate of $15 during the 1975 Graduate Summer Session at OISE, and the allocation of free searches to a number of classes. Overall, though, we feel the profile of user roles is relatively stable, and that administrators will remain its

primary users. Their use of EISO clearly opens the way for the service to have real impact on education. Indeed, that over one-third of EISO's users are administrators is probably one of its major accomplishments.

The distribution of users by their roles in various organizations provides some insight into the way their organizations are using EISO. These distributions for the project's two years are reported separately in Tables 6 and 7. A notable contrast can be made between users in school boards and those in postsecondary institutions including OISE. In the former, users are overwhelmingly in administration: 59% on the average during EISO's first year, and 77% in its second. In the latter, users are distributed across all areas -- teaching, administration, research, library, and, of course, graduate work. Clearly, EISO is being used in school boards to help administrators to make decisions, whereas at OISE and other postsecondary institutions it is used as a resource in learning and research. Determining the impact from its use in these ways will obviously be a long term proposition.

Recognition of EISO's usefulness by board administrators may, in the end, have one unanticipated consequence: the adoption of the automated information centre idea for use in their own boards. This possibility and its implications are discussed further in the last chapter of this report.

To clarify the uses to which EISO was put by users playing different roles in different organizations, second year users were asked to indicate the role for which the search was requested. Table 8 clearly shows that EISO is used for purposes consistent with the users' organizational roles. In school boards, searches generally were conducted for administrative purposes, research or field development, the latter including preparation for professional development days, program planning, etc. Only a relatively small proportion of the usage was for graduate studies being undertaken simultaneously with the users' regular employment. Usage at OISE was concentrated on research and graduate work, little use being made for the purposes of administration and field development. Library usage appeared at an appreciable, though low, level in both school boards and postsecondary institutions. The use of EISO to aid with teaching was surprisingly limited. Though substantial numbers of individuals reported their major role was teaching, they apparently called on EISO primarily when they were involved in research.

TABLE 6 -- PROFESSIONAL ROLE BY ORGANIZATION FOR YEAR 1 USERS (N = 243)

Role	Organization					
	Public Board (n = 78)	Separate Board (n = 22)	Postsecondary (n = 24)	OISE (n = 90)	Ministry of Education (n = 11)	Other (n = 18)
Administration or Supervision	53.8%	63.6%	25.0%	2.2%	9.1%	16.7%
Teaching or Pupil Personnel	25.7	9.0	25.0	14.4	0	5.5
Research	6.4	18.2	0	13.3	9.1	22.2
Field Development or Regional Office	0	0	0	14.4	72.7	5.5
Library	10.3	4.5	8.3	5.7	0	0
Master's Student	0	4.5	20.8	11.1	0	5.5
Doctoral Student	1.3	0	12.5	35.6	0	0
Other	2.6	0	8.3	2.2	9.1	44.4

TABLE 7 -- PROFESSIONAL ROLE BY ORGANIZATION FOR YEAR 2 USERS (N = 119)

Role	Organization					
	Public Board (n = 33)	Separate Board (n = 8)	Postsecondary (n = 23)	OISE (n = 49)	Ministry of Education (n =3)	Other (n = 3)
Administration or Supervision	66.7%	87.5%	17.4%	10.2%	66.7%	33.3%
Teaching or Pupil Personnel	6.1	12.5	47.8	14.3	0	0
Research	6.1	0	8.7	20.4	33.3	33.3
Field Development or Regional Office	3.0	0	4.3	12.2	0	0
Library	12.1	0	0	10.2	0	0
Master's Student	3.0	0	8.7	2.0	0	0
Doctoral Student	0	0	4.3	24.5	0	0
Other	3.0	0	8.7	6.1	0	33.3

TABLE 8 -- ROLE FOR WHICH BIBLIOGRAPHY WAS REQUESTED BY ORGANIZATION FOR YEAR 2 USERS

Role for Which Request Made	Organization					
	Public Board (n = 32)	Separate Board (n = 8)	Postsecondary (n = 23)	OISE (n = 49)	Ministry of Education (n = 3)	Other (n = 3)
Administration or Supervision	43.8%	12.5%	8.7%	2.0%	33.3%	0
Teaching or Pupil Personnel	12.5	0	0	6.1	0	0
Research	18.8	12.5	30.4	34.7	66.7	33.3
Field Development	0	50.0	4.3	2.0	0	0
Library	6.3	0	0	10.2	0	0
Master's Student	6.3	0	26.1	6.1	0	0
Doctoral Student	9.4	12.5	17.4	30.6	0	33.3
Other	3.1	12.5	13.0	8.2	0	33.0

Personal Characteristics

Personal traits as well as organizational types and roles may be important factors in determining whether or not an individual uses the Educational Information System for Ontario. In the first *Interim Report* we discussed some of the traits of innovators, and suggested that early users and adopters of EISO might tend to fit a mold, being more highly educated, more ambitious, and more open to change than those who would not try the service, or who would try it later. Among the characteristics considered here are the user's sex, age, education, professional activities, and previous use of EISO. By comparing first and second year data, it was expected that trends might emerge, suggesting that EISO was broadening its clientele.

The percentage of females using EISO has shown a slight increase to 35% from 30%, but the increase is too slight to place confidence in. If it does represent a real increase, it could be explained by the rise in usage by library personnel, most of whom are women (Table 9).

TABLE 9 -- SEX OF EISO USERS

Sex	Percent	
	Year 1 (n = 376)	Year 2 (n = 119)
Male	69.7	64.7
Female	30.3	35.3

The change in age distribution also reflects some change away from the younger category (26 to 36 years of age) toward older categories (36 to 45 and 46 to 65 years of age), though anomalies occur at either end (Table 10). The change is probably due to the relative increased use of the service by those in established careers in administration and research, as compared to graduate students. This view receives some confirmation by the increased percentage of users who have been in their posts an appreciable length of time (Table 11). In this case, as in the previous two, differences are slight, but nevertheless represent a penetration of the

EISO service into categories of users who would be expected to be somewhat slower to adopt the service.

TABLE 10 -- AGES OF EISO USERS

Age Range in Years	Percent	
	Year 1 (n = 183)	Year 2 (n = 113)
25 or under	2.2	3.5
26 to 35	49.7	36.3
36 to 45	36.1	42.5
45 to 55	9.3	15.9
56 to 65	2.7	0.9
over 65	0	0.9

TABLE 11 -- NUMBER OF YEARS IN CURRENT POSITION

Interval in Years	Percent	
	Year 1 (n = 184)	Year 2 (n = 116)
Less than 1	21.2	12.9
1	10.9	12.1
2	9.8	16.4
3	11.4	12.9
4 to 6	24.5	20.7
7 to 9	14.1	13.8
10 or more	8.2	11.2

Professional activities of users reported in the two years show virtually no change (Tables 12, 13, and 14). In both years, 62% had been

TABLE 12 -- OFFICER OF A PROFESSIONAL ORGANIZATION

Response	Percent	
	Year 1 (n = 183)	Year 2 (n = 115)
Yes	61.7	61.7
No	38.3	38.3

TABLE 13 -- PARTICIPATED IN EDUCATIONAL RESEARCH PROJECT IN THE PAST FIVE YEARS

Response	Percent	
	Year 1 (n = 185)	Year 2 (n = 115)
Yes	75.7	76.5
No	24.3	23.5

TABLE 14 -- PRESENTED A PROFESSIONAL PAPER IN THE PAST FIVE YEARS

Response	Percent	
	Year 1 (n = 185)	Year 2 (n = 115)
Yes	53.1	54.8
No	47.0	45.2

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officers of professional organizations, about three quarters had participated in an educational research project, and slightly over half had presented a professional paper in the past five years. Though we have no comparative data for educators as a whole, we do not consider it too unreasonable to suggest that the professional activities of EISO users are well above normal.

The education of EISO users is also no doubt exceptional, with approximately 14% holding doctorates and 57% a master's degree, for a total of 71% with graduate degrees (Table 15). And EISO users seem to be deciding in favour of continuing their education. The percentage presently

TABLE 15 -- HIGHEST DEGREE EARNED

Degree	Percent	
	Year 1 (n = 175)	Year 2 (n = 111)
Bachelor's	30.3	27.0
Master's	54.3	57.7
Doctorate	14.9	14.4
Other	0.6	0.9

in or planning to apply for academic programs leading to a higher degree increased from 37% to 46% (Table 16). If individuals with doctorates were removed from the total, these figures would be still higher. Clearly, EISO users are professionals who place an exceedingly high value on education.

TABLE 16 -- PRESENT OR PLANNED STUDIES FOR HIGHER DEGREE

Response	Percent	
	Year 1 (n = 382)	Year 2 (n = 112)
Yes	37.2	46.4
Not Sure	20.7	15.2
No	42.1	38.4

While a comparison of personal profiles of the typical EISO user for each of the project's two years suggests that some change has occurred, these differences are relatively minor. The description of the average EISO user as made in the first *Interim Report* stands. He is either a male administrator from a school board or researcher from OISE who is in his mid-thirties and is quite active professionally, is involved in research, and is planning to undertake further education. He is, in short, the archetypical innovator or early adopter.

Adoption of EISO as an Innovation

What makes an adopter an adopter? Trying something once? Twice? As we have indicated previously (Chapter VII, first *Interim Report*), the adoption cycle begins with awareness and a perceived need, followed by trial adoption, evaluation, and, if the evaluation is positive, adoption. If a single trial is not sufficient to judge the merits of an innovation or if the decision is uncertain, there may of course be several trial uses before adoption or rejection occurs. In any case, we know that if people are adopting EISO as part of their personal system of information resources, then the numbers of repeat users should be increasing.

Awareness of EISO among educators has been fostered in numerous ways, including mailing of many brochures, presentations at meetings and conventions, class instruction, etc. How users became aware of EISO is another matter. As Table 17 indicates, some techniques worked (e.g., direct mail brochures) and others did not (e.g., articles and advertisements). One of the most effective disseminators of information about EISO has been the reference librarians in the OISE Library, who, on their own initiative, effectively made it a policy to refer people to EISO whenever they thought it might be of assistance in meeting the individual's information needs. Similarly, colleagues' recommendations have been a major factor in creating awareness about EISO. While this type of dissemination is beyond direct control, an attempt to maximize its effectiveness was made by selecting key groups for EISO demonstrations.

Awareness of a service is not sufficient to motivate the use of a new service, however. Something more is needed -- a purpose at hand. The purposes that helped to motivate EISO users, reported in Table 18 grow out of the organizational roles and personal ambitions that users hold. The graduate student needs information for term papers; the active superintendent for program development; and the OISE professor for research.

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TABLE 17 -- METHOD OF LEARNING ABOUT EISO

Method	Percent	
	Year 1 (n = 384)	Year 2 (n = 118)
Brochure	35.7	30.5
Article or Advertisement	1.3	3.4
Professional Development Day	0.3	0
Class Instruction	6.5	4.2
Colleagues	33.9	23.7
EIC	5.2	2.5
Library	2.8	16.9
EISO Staff	n/a[1]	8.5
Other	13.9	9.3

[1]Not a response on Version A of User Evaluation Questionnaire.

TABLE 18 -- PURPOSE OF SEARCH

Purpose	Percent	
	Year 1 (n = 386)	Year 2 (n = 119)
Term Paper	31.3	24.4
Bibliography	3.6	3.4
Curriculum Development	7.5	12.6
Program Improvement	12.7	16.0
Speech or Article	2.8	4.2
Research and Development Report	28.8	24.4
Browsing	2.1	0.8
Personnel or Recruitment	2.1	1.7
Policy Development	6.7	10.1
Other	2.4	2.5

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A comparison of the purposes motivating searches in the two years shows a decrease in its use for student term papers, and an increase in its use for professional matters like curriculum development (up to 13% from 8%), program improvement (up to 16% from 13%) and policy development (up to 10% from 7%). These changes are of substantial practical importance since they reflect an increasing use of the information obtained for making decisions about the educational system.

Being aware of EISO and having a purpose at hand, the user next contacts someone with access to the system. Most users contact the search analyst directly, as Table 19 suggests. In fact, among those returning

TABLE 19 -- WHO ASSISTED IN FORMULATING SEARCH REQUEST

Role of Assistant	Percent	
	Year 1 (n = 382)	Year 2 (n = 119)
Search Analyst	85.9	98.3
Field Centre EIC	7.3	0
Faculty of Education EIC	0.5	1.7
Ministry of Education EIC	1.6	0
CAAT EIC	0.3	0
Not Sure	1.3	0
Other	3.1	0

questionnaires, there has been a significant decline in the use of EICs' in the Northeastern Region. Whether this decline reflects the exhaustion of free searches in the area, a changing of the EIC role into more of a referral service, or simply a poor return of questionnaires, we cannot yet say. However, discussion with the search analyst and EICs suggest that both the EICs and search analyst may be involved in formulating a search request, albeit at different stages. Contact with the search analyst is made by phone, mail, or in person (Table 20).

Having conducted a search and acquired material, the user will need access to a microfiche reader if some of the materials are ERIC documents on microfiche. About three-quarters of the respondents had these available,

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TABLE 20 -- MODE OF INITIAL CONTACT

Mode of Contact	Percent	
	Year 1 (n = 385)	Year 2 (n = 119)
In Person	52.7	52.9
Telephone	32.5	29.4
Mail	14.8	17.6

but only one-third had access to a portable fiche reader (Tables 21 and 22). Even so, the latter figure is a marked increase from the 11% reported in the first year. We suspect that the availability of microfiche readers, particularly portable readers, represents an organizational commitment to the use of microfiche and may be a good index of an agency's innovativeness with regards to new forms of information. In an assessment of the correlates of repeat users of EISO, the availability of a portable fiche reader proved to be one of the few statistically significant predictors of who would become a regular client.

TABLE 21 -- AVAILABILITY OF MICROFICHE READER

Response	Percent	
	Year 1 (n = 382)	Year 2 (n = 118)
Yes	85.6	73.7
Not Sure	3.4	5.9
No	11.0	20.3

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TABLE 22 -- AVAILABILITY OF PORTABLE FICHE READER

Response	Percent	
	Year 1 (n = 382)	Year 2 (n = 113)
Yes	11.0	35.4
Not Sure	89.0 [1]	24.8
No		39.8

[1]Question phrased in different way on Versions A and B of User Evaluation Questionnaire.

The overall likelihood of repeat use is suggested in Table 23, which reports the percentages of searches completed for individuals who had

TABLE 23 -- NUMBER OF PREVIOUS EISO SEARCHES

Number of Previous Searches	Percent	
	Year 1 (n = 386)	Year 2 (n = 119)
None	69.2	60.5
1	15.8	15.1
2	4.7	9.2
3 to 5	6.0	10.1
6 or more	4.4	5.1

previously conducted EISO searches. Overall, there is, as one would expect, an increase in those reporting a number of previous searches. These figures are in fact conservative since EISO decided to stop sending evaluation questionnaires to users who had completed five searches in order to avoid placing too great an imposition upon them. At a later date, data on numbers of searches will be recovered from search request forms to provide a more accurate count.

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If one assumes the cautious view that not until the third search has a user become an adopter, then it can be fairly stated that a quarter of EISO searches were conducted by adopters during its second year. Case studies have been made of two EISO adopters, one in a school board and one in a government agency. The first, Mr. Bob O'Neill, is a superintendent with the London-Middlesex Separate School Board. His experiences were recounted in an article that appeared as an "Adminnovation" in *OCLEA* (Appendix C). Mr. O'Neill exhibits many of the traits detailed above as being typical of innovators and early adopters, e.g., a male school administrator with a master's degree. In addition, Mr. O'Neill was already a regular user of ERIC materials and had his own portable fiche reader even before EISO began providing computer access to ERIC. As a result, he was able to make immediate use of the service, and was one of its earliest adopters.

Another adopter is Dr. Jane Smith (a fictitious name) who is employed in a government agency. Her experience with her first search is described in "One User's Experience," Chapter VI of the first *Interim Report*. Dr. Smith gave the first search a satisfactory review, was impressed with the service, and has returned since to do two additional searches. She is highly educated and involved in research and policy studies, characteristics that help to make her an early adopter.

The home organizations of repeat users can be inferred from Table 24, which presents the average search number for members in different organizations. The higher the number, the more times individuals from the type of institution named have conducted repeat searches. Evidently, the most regular EISO users are from school boards, where the mean search number for public and separate boards combined was 2.51. This conclusion is promising, since it suggests that a regular clientele from school boards is being created, a clientele that could become an important factor in EISO's wider use.

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TABLE 24 -- AVERAGE NUMBER OF PREVIOUS SEARCHES BROKEN DOWN BY ORGANIZATION FOR SECOND-YEAR USERS

Organization	$\bar{X}$	s	n
Public Board	1.03	2.14	33
Separate Board	8.63	8.28	8
Postsecondary	0.09	0.29	23
Ministry of Education	1.00	1.00	3
OISE			
Academic	0.82	1.10	33
Research and Field Development	1.73	1.74	11
Library	1.60	1.82	5
Other	0.67	0.16	3

Test of Significance: $F_{7,111} = 10.56$ .01 Level

Conclusion

EISO users represent a cross-section of Ontario educators. They come from all parts of the province, are members of diverse educational organizations, and have many different roles. If a goal of EISO was to make educational information widely available, it has certainly succeeded.

Relative to population, the areas most heavily represented among EISO's users are the Northeastern Region of the province and Metropolitan Toronto. The pre-eminence of the first area is explained by the extensive publicity, provision of trained Educational Information Consultants and allocation of free searches in the region. The large number of users from Toronto, on the other hand, is probably due to the proximity of the users to EISO and the concentration of educational researchers in the city.

School boards and OISE each provide about 40% of EISO's users, with the remainder coming from the Ministry of Education, CAATS, faculties of education, etc. In comparing the distributions of clients' organizations reported during EISO's first year with that of the second, a trend toward

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a greater percentage of users from universities and faculties of education was noted.

Approximately one-third of EISO's clients were administrators; teachers, researchers and graduate students each represented one-sixth of the total. The majority of users in school boards were administrators, followed by teachers and librarians. Those from OISE tended to be either graduate students, who formed about one-third of the OISE users, or individuals involved in research, field development, or the library.

Most users conducted searches which were related to their primary professional role. Few users from school boards, for example, requested EISO searches for completing term papers or dissertations required as part of graduate studies in which they were involved. Overall, about 25% of the searches were conducted for term papers, 25% for research and development, and 15% each for curriculum development, program improvement, and policy development. Over the two years, the use of EISO for professional purposes increased, a trend largely due to the decrease in its use by graduate students.

The typical EISO user was a man between the ages of 36 and 45 who held a master's degree and had been in his present position four to six years. In all probability he had been an officer of a professional organization and had been involved in doing research. Chances were about even that he had prepared a professional paper in the past five years. This profile is what would be expected for an early adopter of an educational innovation.

The average user first became aware of EISO either from a colleague or from an EISO brochure. Increasingly, users have been referred to EISO by libraries, especially the OISE Library. About half of the clients contacted the search analyst directly when requesting a search, one-third phoned in their request, and the remainder used the mails. About 40% of all searches were conducted for individuals who had used the service at least once before.

Finally, three-quarters of the users reported that they had access to a microfiche reader; one-half had access to a portable microfiche reader in the second year. The latter figure represented a considerable increase over the preceding year, suggesting that microfiche equipment is becoming more readily available.

The major conclusion that can be drawn from this overview of the users of EISO was made in the opening paragraph: EISO has succeeded in

reaching a broad cross-section of educators in Ontario. These users appear to be making use of the service in ways that had been anticipated -- for program development, curriculum planning, research, and term papers. Clients from boards, it is important to note, are using the service to help them solve board problems, not to assist them in outside professional course work.

At the same time, it must be acknolwedged that renewed efforts must be undertaken to attract users from school boards. While advertisements, articles, and demonstrations have not been particularly effective in attracting users, mailed brochures and word-of-mouth among colleagues have been. The latter two modes of informing users about the service EISO provides should be emphasized in the future.

Much of the effectiveness of dissemination of information about EISO has been done by satisfied users. An assessment of the level of satisfaction expressed by the average user is the topic of the next chapter.

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CHAPTER 3

Levels of Satisfaction Among EISO Users

Every user conducts some sort of personal assessment of EISO and its components. This evaluation is one of the stages of the adoption model but it also occurs every time a search is conducted. EISO continuously monitors its clients' reactions by requesting them to complete a number of items on the EISO User Evaluation Questionnaire.

Results concerning the levels of satisfaction for users during EISO's first and second years are provided in this chapter. Data are presented both annually and broken down by month in order to assess any trends. Analyses for both scales and items provide a good insight into the strengths and weaknesses of EISO's service. Before proceeding with these analyses, though, we shall deal with a technical matter, the reliability of the satisfaction scales.

Reliability: Some Comments

Measurements of all kinds must be reasonably precise if they are to be useful. This statement holds for the measurement of psychological variables like satisfaction as much as it does for physical measures like length, though the determination of reliability is more difficult for the former than the latter. For example, the length of a room can be measured several times and the results might be expressed as 3 metres ±2 centimetres, where ±2 centimetres represents the error in measurement. But how does one assess the reliability of an attitudinal measure?

Repeating a measurement, as in the preceding example, is one method of determining reliability that is used for psychological as well as physical measurements. However, for scales such as the six satisfaction subscales used in this study that relate to the user's level of satisfaction,

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reliability is more often determined by assessing a scale's internal consistency. That is, one asks the question, Does the "reading" from item 1 agree with the "reading" from item 2? If so, then the scale is considered to be internally consistent, and hence reliable. In a sense, each item of a scale serves as a measure of the same characteristic, such as a person's satisfaction, and in using a scale of several items, several simultaneous measurements are obtained, i.e., several repeated measures.

Reliability is normally expressed in terms of either a reliability coefficient or the standard error of measurement. The nearer the reliability coefficient is to its maximum value of 1, the greater the reliability of the scale. Expressed as a percentage, it represents the amount of variation in the measure which is "true" as opposed to "error" variation. Subtracting the coefficient from 1 provides an estimate of the proportion of variation due to error (i.e., $1 - r_{tt}$ where r_{tt} is the reliability coefficient). If the total scale variation is V_t, then the error variance is given by $V_e = V_t(1 - r_{tt})$, and the standard error of measurement is the square root of V_e. That is, $S.E._{meas.X} = \sqrt{V_e}$ where X is the variable whose reliability is being assessed.

The particular method of computing an estimate of the reliability of satisfaction scales used here is that of Hoyt (Kerlinger, 1973, p. 452), which uses analysis of variance to test a scale's reliability. However, one problem arises with this and other measures of reliability: they depend on the existence of true variation in the measure in question. If, in fact, no variation is present or it is extremely small, then the reliability will be 0 or near 0, as can be seen from the formulas above. This problem is quite serious, but can usually be overcome in psychological testing by including increasingly difficult items in order to spread scores over a greater range. That this solution sometimes results in the inclusion of trivial or esoteric items is not important in terms of the test's reliability, though it may create grounds for questioning its validity. The problem of small or 0 variation is not so easily solved, however, when the actual distribution of scores is relatively compact, and the scale cannot be stretched by adding more difficult items. In those cases, the reliability coefficient may be low not because the scale is inherently unreliable, but because the population being measured lacks appreciable variation among its members. An alternative assessment of a measurement's reliability useful in these situations can be made by comparing its standard error of measurement with the range of potential

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variation the scale exhibits. For example, assume that a scale's range is three points, where 1 = dissatisfied, 2 = satisfied, and 3 = very satisfied, and that its standard error is only .15. Even if the scale has low reliability, the ratio of the standard error to the scale's range is so great (namely, 20 to 1) that we can have confidence in the scale's precision. And such a situation is not far fetched, but would occur whenever a very large proportion of the population made the same response, e.g., very satisfied.

The problem created by low population variance described above was observed repeatedly for measures of EISO users' satisfaction. In many cases, virtually all respondents reported a very high degree of satisfaction, and hence little variation was observed. For example, when asked about their satisfaction with the helpfulness of the search analyst or the Educational Information Consultant, those using EISO during the period from July 1975 through April 1976 were overwhelmingly positive: 91% reported a high level of satisfaction: 14% a medium level; and 2% a low level. This item plus two others formed the subscale measuring user satisfaction with the "Quality of Service," and all three items exhibited low variation. As a result, this scale's coefficient of reliability cannot be taken as an adequate estimate of the precision of the measurement. This must be determined by contrasting the scale's standard error with the scale's full range.

High reliability for measurement scales, while always of value, is not as necessary when one is concerned with groups rather than individuals. The average satisfaction of EISO users is a group characteristic, rather than an individual trait. It is based on measurements taken on a large number of individuals, and as a result it can be estimated more precisely than the satisfaction of an individual person. In psychological testing where individual assessments are being made, a test must be so reliable that just one measurement is sufficiently accurate. Fortunately this is not the case for this study.

The best measure of reliability for the group average is the standard error of measurement for the mean. This standard error, which differs from the standard error of X, is given by $S.E._{meas\ \bar{X}} = S.E._{meas.X} / \sqrt{n}$, where n is the sample size. Clearly, the sample size is an important factor in ensuring a precise estimate: the larger the n, the smaller the standard error of measurement for the mean. Thus, even when a scale is not particularly reliable in and of itself, a reliable estimate can be obtained

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for a population mean by ensuring a large sample is obtained. Of course, a large sample size also reduces the uncertainty or error due to sampling variation.

In the presentation of reliabilities for the satisfaction scales that follow, the various points made in this discussion are of considerable importance. Though some scales revealed little variation and hence had low reliabilities, this limitation is offset by the small size of the error when judged against the magnitude of the scale, and when the group mean is the measurement whose precision is of interest.

Reliability of Satisfaction Scales

In all, five subscales were used to measure user satisfaction with different facets of the Educational Information System for Ontario: Publicity Materials and Directions, Quality of Service, Timeliness of Service, Quality of Technology, and Value of Bibliographic Materials (see Table 25). In addition, a composite scale was used to assess the Overall Satisfaction. The latter scale is the sum of six items tapping six aspects of the service to which all users were exposed and could therefore validly assess. Response rate for these six items was very high, thereby providing a large sample for computing a reliability estimate. The sum of all the 15 individual items used on the five subscales was not used for this overall scale since in some cases only a small number of users had utilized a specific aspect of the service, e.g., ordering microfiche copies. Had all items been included in the overall scale, the overall assessment could only have been based on the small number of users who had exploited all features of the service.

The reliability and standard errors of measurement for the six scales are reported in Table 26, together with descriptive statistics (mean, standard deviation, and number in sample). All estimates of reliability are based on EISO users who requested searches between July 1975 and April 1976, and who responded to all items on each of the scales in question.

Table 26 indicates that all but one of the six scales are sufficiently reliable for one to be confident of the results. Reliabilities in descending order are as follows: Publicity Materials and Directions, .80; Value of Bibliography, .79; Timeliness of Service, .78; Quality of Service, .62; Overall Satisfaction, .58; and Quality of Technology, .27. Even for Quality

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TABLE 25 -- SATISFACTION SCALES AND ITEMS BY YEAR

Aspects of EISO	
Year 1	Year 2
Publicity Materials and Directions	
Accuracy of publicity materials, EISO presentations, etc. Comprehensiveness of publicity materials, EISO presentations, etc.	Accuracy and comprehensiveness of publicity materials
Adequacy of directions for submitting search requests to EISO	Convenience of arrangements and and adequacy of directions to obtain EISO searches
Adequacy of directions for ordering copies of materials	Adequacy of directions for ordering copies of materials listed in bibliography
Quality of Service	
Convenience of arrangements to obtain EISO searches	Convenience of arrangements and adequacy of directions to obtain EISO searches
Helpfulness of search analyst or Educational Information Consultant	Helpfulness of search analyst or Educational Information Consultant
Time devoted to search interview with search analyst or Educational Information Consultant	--
Timeliness of Service	
Time taken to deliver the EISO bibliography	Time taken to deliver the EISO bibliography
Time taken to deliver microfiche or paper copies ordered from EDRS in the U.S., if applicable	Time taken to deliver microfiche or paper copies ordered from EDRS
Time taken to deliver microfiche or paper copies ordered from EISO	Time taken to deliver microfiche or paper copies ordered from EISO

00050

TABLE 25 (Cont'd.)

Aspects of EISO

Year 1	Year 2
Quality of Technology	
Length of bibliography	Length of bibliography
Readability of microfiche copies if applicable	Readability of microfiche copies
Availability of microfiche readers	Availability of microfiche readers
Value of Bibliography and Materials	
Value of bibliography itself	Value of bibliography itself
Value of materials located via EISO bibliography	Value of materials located via EISO bibliography
Overall Satisfaction	
Convenience of arrangements to obtain EISO search	Convenience of arrangements and adequacy of directions to obtain EISO searches
Time devoted to search interview with search analyst or Educational Information Consultant	--
Helpfulness of search analyst or Educational Information Consultant	Helpfulness of search analyst or Educational Information Consultant
Length of bibliography	Length of bibliography
Value of bibliography itself	Value of bibliography itself
Value of materials located via EISO bibliography	Value of materials located via EISO bibliography

00051

TABLE 26 -- RELIABILITY OF SATISFACTION SCALES*

Scale	n¶	$\bar{X}$†	S.D.$_X$	r_{tt}	S.E. meas.X	S.E. meas.$\bar{X}$
Publicity Materials and Directions	88	2.57	1.00	0.80	0.39	0.04
Quality of Service	200	2.81	0.60	0.62	0.30	0.02
Timeliness of Service	25	2.31	1.09	0.78	0.42	0.08
Quality of Technology	56	2.42	0.76	0.27	0.54	0.07
Value of Bibliography and Materials	133	2.24	0.87	0.79	0.28	0.02
Overall Satisfaction	180	2.61	0.79	0.58	0.47	0.04

*Hoyt estimates of reliability based on users requesting searches between July 1975 and April 1976.

¶Sample size for subsample for which complete responses were available. Total population was n = 387.

†Scale totals have been adjusted for number of items to provide means, standard deviations and standard errors on original three-point scale: 1 = low satisfaction, 2 = medium satisfaction, and 3 = high satisfaction.

of Technology, however, the measurement error for the mean is small, only .07. This value provides a sufficiently precise estimate of the mean for us to infer with confidence that there is a moderate level of satisfaction with the technological aspects of the service; i.e., with the readability of microfiches, length of the bibliography, and the availability of microfiche readers. An item analysis of this scale carried out to uncover the cause of the scale's low reliability showed that the three items had correlations of only .20, .15, and .09 with the subtotals based on the opposing two items. All correlations are small, thereby indicating that each item has little in common with the other two. It would appear that the items measure, in essence, individual characteristics of the EISO service that are relatively unrelated to one another.

The reliability of the Overall Satisfaction scale, though adequate, is somewhat lower than might be preferred. The compact, positively skewed distribution of scores account for this situation (see Figure 2). Item analyses indicated each of the six items on the scale had a positive correlation of between .23 and .46 (values significant at the .01 level) with the subtotal based on remaining scale items. That is, all were good items and contributed to the scale. Also, the large sample size makes the estimate of the average Overall Satisfaction very accurate.

Trends in Levels of User Satisfaction

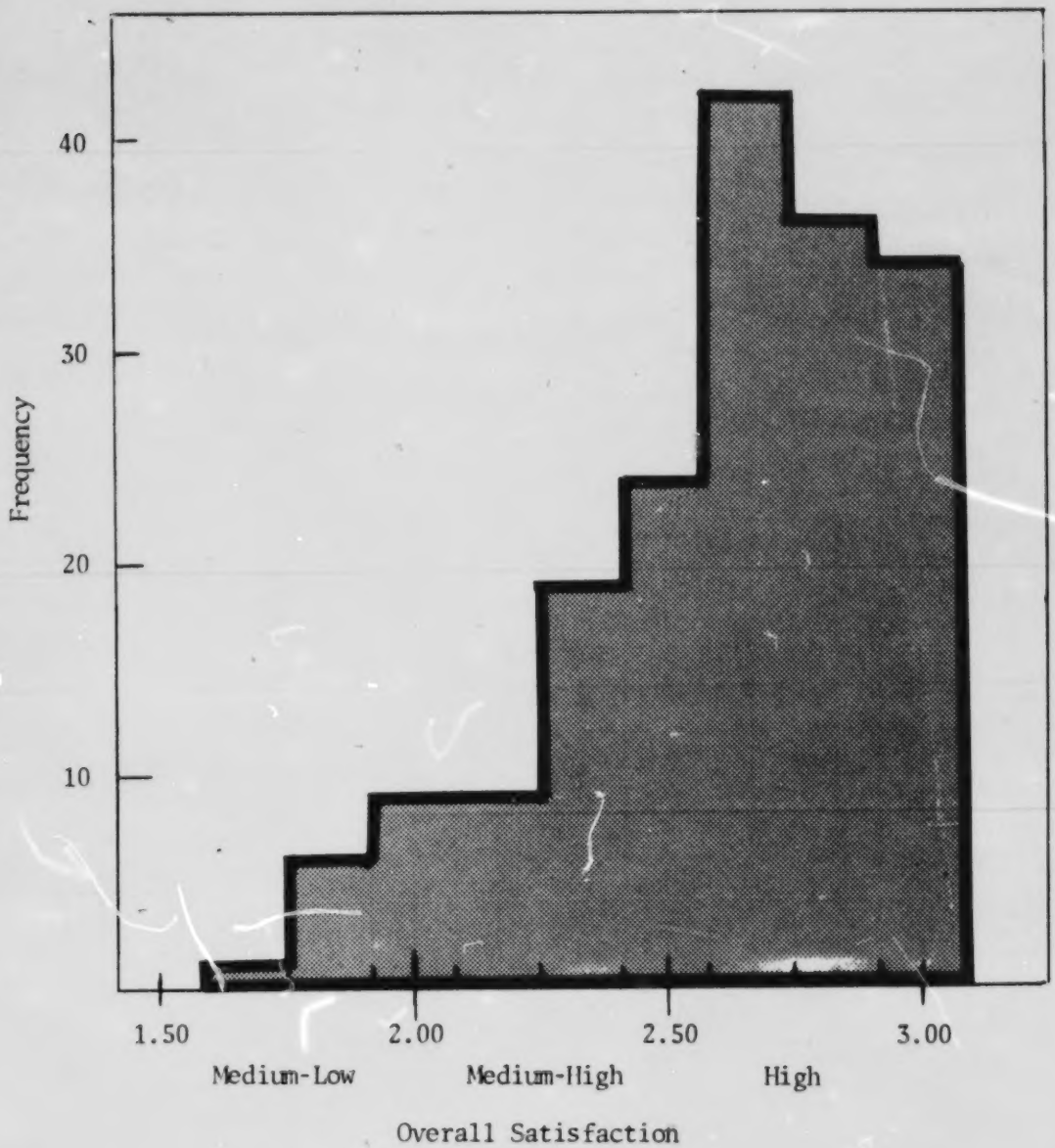
Data showing the client's satisfaction with the Educational Information System for Ontario and the materials it provides have been collected for a period of sixteen months spanning two years of operation. This section analyses these data in order to discern if any changes have occurred, and to establish reasonable standards for performance. First, data are broken down by year and then by month, with satisfaction scale means being treated first, followed by the analysis of item means. Subsequently, graphs portraying trends on a monthly basis are presented, again with scale means analysed first and item means second.

Comparison of Yearly Averages

First and second year users' average level of satisfaction with EISO's five dimensions are reported in Table 27, which indicates that there is no appreciable difference in the service's effectiveness over the two years. Changes in average levels of satisfaction ranged from an increase

C0054

FIGURE 2 -- FREQUENCY DISTRIBUTION FOR OVERALL SATISFACTION



00055

TABLE 27 -- SATISFACTION SCALE MEANS, STANDARD DEVIATIONS, AND FREQUENCIES[1]

Scale	Satisfaction						t	Significance
	Year 1			Year 2				
	$\bar{X}$	s	n	$\bar{X}$	s	n		
Publicity Materials and Directions	2.57	1.00	88	2.53	0.44	101	-0.481	n.s.
Quality of Service	2.81	0.60	200	2.73	0.38	108	-1.205	n.s.
Timeliness of Service	2.31	1.09	25	2.37	0.47	17	0.234	n.s.
Quality of Service	2.42	0.76	56	2.46	0.39	43	0.317	n.s.
Value of Bibliography and Materials	2.24	0.87	133	2.21	0.72	88	-0.241	n.s.
Overall Satisfaction	2.61	0.77	180	2.55	0.35	95	-0.754	n.s.

[1]Scale means relate to a three point scale: 3 = high satisfaction, 2 = medium satisfaction, and 1 = low satisfaction.

of .06 for Timeliness of Service to a decrease of -0.08 for Quality of Service, neither of which is statistically significant. Overall Satisfaction, too, did not exhibit a statistically signficiant difference from the previous year's level. Thus, the average user perceived EISO as providing a consistent level of service over the two years. Further, users expressed a high level of Overall Satisfaction in the two years. That is, in both years the average was in the 2.5 to 3.0 range on the three-point scale being used. High levels of satisfaction were also expressed for Publicity Materials and Directions, and Quality of Service. Medium-high levels of satisfaction (in the 2.0 to 2.5 range) were expressed for Timeliness of Service, Quality of Technology, and the Value of Bibliography and Materials. The last of these is, in the long run, probably the most important dimension since it refers to the system's output. More detailed presentation of responses to this item is given in Table 28, which reports the percentages who expressed high, medium, or low satisfaction with the Value of Bibliography and Materials. Approximately half of all users in both years

TABLE 28 -- PERCENTAGE DISTRIBUTION FOR SATISFACTION WITH QUALITY OF BIBLIOGRAPHY AND MATERIALS BY YEAR

Level of Satisfaction[1]	Percent	
	Year 1 (n = 133)	Year 2 (n = 95)
High	45.1	47.8
Medium	45.1	35.2
Low	9.8	17.0

[1]Classifications are as follows: High, 2.50 or 3.0; Medium, 1.5 or 2.0; and Low, 1.00.

were highly satisfied, an additional third indicated a minimum level of satisfaction, and the remainder a low level. Put another way, 85% of all clients were satisfied with the quality of EISO's output.

Even though the analysis of responses to the five rating scales indicates that service has been established and maintained at a high level over two years, more detailed analysis of responses on individual scale items is warranted in order to focus on specifics (Table 29). Only one item

00058

TABLE 29 -- SATISFACTION ITEM MEANS, STANDARD DEVIATIONS AND FREQUENCIES

Scale Item	Satisfaction						t	Significance
	Year 1			Year 2				
	$\bar{X}$	s	n	$\bar{X}$	s	n		
Publicity Materials and Directions								
Accuracy and comprehensiveness of publicity materials	2.45	0.66	112	2.37	0.62	105	-1.03	n.s.
Adequacy of directions for submitting search requests[1]	2.68	0.55	143	--	--	--	--	--
Convenience of arrangements and adequacy of directions[1]	--	--	--	2.70	0.47	114	--	--
Adequacy of directions for ordering copies of materials	2.51	0.69	182	2.51	0.60	108	0	n.s.
Quality of Service								
Convenience of arrangements to obtain EISO searches[1]	2.84	0.41	237	--	--	--	--	--
Convenience of arrangements and adequacy of directions[1]	--	--	--	2.70	0.47	114	--	--
Helpfulness of Search Analyst or EIC	2.88	0.37	225	2.77	0.50	112	-2.34	.01
Time devoted to search interview[2]	2.71	0.58	208	--	--	--	--	--

TABLE 29 (Cont.d)

Scale Item	Satisfaction						t	Significance
	Year 1			Year 2				
	$\bar{X}$	s	n	$\bar{X}$	s	n		
Timeliness of Service								
Time taken to deliver bibliography	2.64	0.63	224	2.55	0.62	116	-1.26	n.s.
Time taken to deliver materials from EDRS	2.24	0.83	33	2.15	0.66	27	-0.46	n.s.
Time taken to deliver materials from EISO	2.42	0.72	53	2.48	0.67	33	0.39	n.s.
Quality of Technology								
Length of bibliography	2.41	0.66	227	2.43	0.63	110	0.26	n.s.
Readability of microfiche copies	2.33	0.70	93	2.29	0.61	62	-0.37	n.s.
Availability of microfiche readers	2.58	0.67	121	2.56	0.60	57	-0.19	n.s.
Value of Bibliography and Materials								
Bibliography itself	2.19	0.69	221	2.21	0.72	110	0.35	n.s.
Materials located via bibliography	2.25	0.68	134	2.18	0.79	90	-0.71	n.s.

[1]Separate questions concerning convenience of arrangements and adequacy of directions for submitting search requests were asked in Year 1, but the two items were combined in Year 2.

[2]Item on time devoted to search interview did not appear on Year 2 questionnaire.

exhibited a statistically significant difference. The change observed for that item, which concerns the helpfulness of the search analyst, is not of concern since, even taking the decline of .11 units into account, the average response indicates an exceedingly high level of satisfaction. Indeed, in both years the helpfulness of the search analyst was the most highly rated characteristic of the service, a fact which speaks well of the professionals employed in this position.

Monthly Trends

In addition to the annual breakdown of data, further analysis of data by months is needed to discover any effects due to the month to month variation in the volume of EISO's business or to significant changes which have taken place in the system. Two changes warrant special mention, one of a technological nature and the other concerned with changes in personnel.

The major technological change that has occurred during EISO's two years is the development of more powerful computer programs for searching bibliographic data bases. Most important of these improvements is the ability of the computer to search the text of abstracts and titles in order to locate strings of words. For example, a phrase like "Early School Leaving" might be used to locate articles on that topic. In this way, articles and documents can be located before the appropriate term enters the indexer's vocabulary. This type of string search capability is available now on Lockheed Information System's DIALOG retrieval system but not on System Development Corporation's ORBIT. The fact that DIALOG offers the ability to search strings of words, combined with the large number of social science data bases which are available from LIS but not from SDC, has influenced EISO's search analyst to do an increasing number of searches on Lockheed's DIALOG. This trend began slowly in late 1976, but accelerated in 1977 after Lockheed reduced its prices. Now, most of EISO's searches are carried out on Lockheed's system whereas at the start of the project SDC was used almost exclusively. The impact of this change on user satisfaction is a question that we shall address later, but it is a factor that could be reflected in month to month changes in levels of user satisfaction.

The major personnel change affecting EISO's operations was the replacement of its first search analyst, who resigned at the end of April, 1976. Unlike the first search analyst, the new analyst came to EISO with

C0063

no experience in using computerized bibliographic search services, though she did have an excellent background in the humanities, social sciences, and education librarianship. As a result, she was trained in computerized searching on-the-job under the tutelage of the first search analyst, and at training sessions offered by LIS and SDC. In spite of these training opportunities, it was expected that there would be a period during which user satisfaction might suffer because of the inexperience of the new search analyst, and that the monthly trend in levels of satisfaction would reflect this impact.

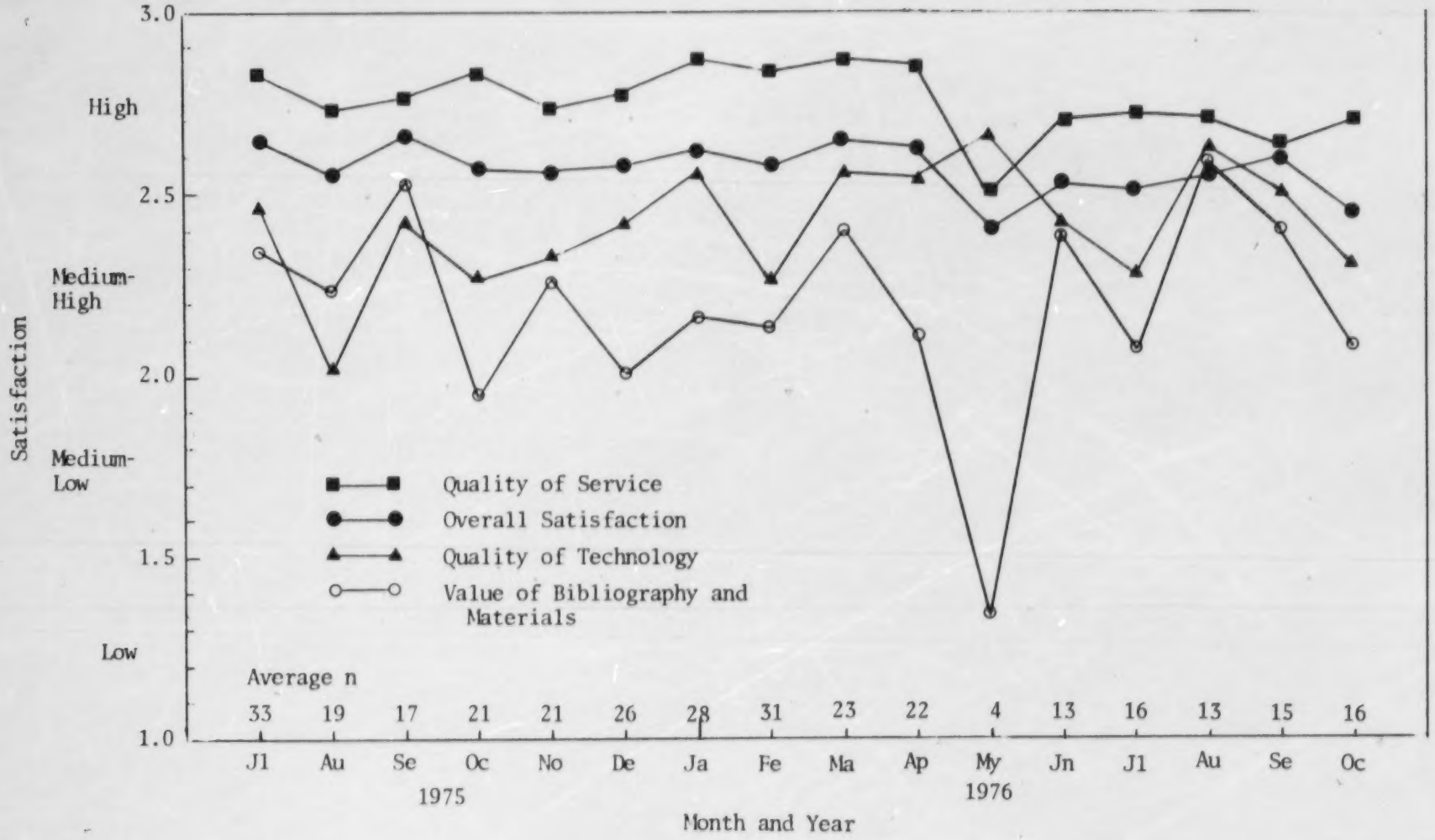
Figure 3 displays the month to month average level of satisfaction reported by users for four of the six scales used to assess EISO's effectiveness. Included are Quality of Service, Quality of Technology, Value of Bibliography, and Overall Satisfaction. The remaining two scales, measuring satisfaction with Publicity Materials and Directions and Timeliness of Service are omitted because the first was not affected by any system changes, and the second had too few responses to provide sufficiently precise estimates of monthly averages.

Overall Satisfaction has been remarkably steady for the entire period of the service, always ranging from between 2.4 and 2.7 on the three-point scale being employed. During the tenure of the first search analyst, the monthly average remained within ± 0.1 units of 2.6. In contrast, during the period from May 1976 to September 1976, while the new search analyst was gaining experience, Overall Satisfaction changed considerably, rising from a low of 2.4 to a high of 2.7. This is the type of trend line that had been expected. However, there was a significant decline in average satisfaction in October, a month in which use of the service peaked with 55 search requests. Apparently, it was not possible for EISO to maintain a consistently high level of performance when demand escalated beyond a certain point.

The three components of Overall Satisfaction exhibited somewhat different trends: Quality of Service remained at 2.8 ± 0.1 during the first year, and 2.7 ± 0.1 during the second year, except for May, the new search analyst's first month. However, in interpreting this trend, the size of samples on which the estimates of averages are based should be borne in mind. Only four EISO User Evaluation Questionnaires were returned for searches completed in May. Such a low number provides a very imprecise estimate of the mean. In fact, estimates of all second year means are based on fewer responses than are monthly estimates for

C0064

FIGURE 3 -- AVERAGE USER SATISFACTION BY MONTH



the first year, thereby making the second year estimates means intrinsically less precise and more variable than those for the first year. As a result, second year "trends" are more jagged.

Quality of Technology, another component of overall satisfaction, is extremely variable throughout the two years. Its range is extremely wide: 2.4 ± 0.4. On the whole, it must be concluded that no discernible trend has occurred, and that neither the search analyst nor search system has influenced this factor.

The Value of Bibliography and Materials also fails to exhibit any trend. Its range is 2.2 ± 0.4, though the very low level in May can be discounted both due to the small sample size and the fact that it was the search analyst's first month.

The ranges indicated for the scales above provide baseline data for setting standards for performance (Table 30). A periodic assessment of a search service could be carried out using the six scales employed in this study as standards to judge the acceptability of the service's performance.

TABLE 30 -- INITIAL ESTIMATE OF ACCEPTABLE LIMITS OF PERFORMANCE AS MEASURED BY USER SATISFACTION

Variable	Annual Average	Monthly Minimum	Monthly Maximum	Ranges
Scales				
Overall Satisfaction	2.55	2.4	2.7	0.3
Quality of Service	2.75	2.6	2.9	0.3
Quality of Technology	2.40	2.0	2.8	0.8
Value of Bibliography and Materials	2.20	1.8	2.6	0.8
Items				
Helpfulness of search analyst	2.75	2.6	2.9	0.3
Convenience of obtaining search	2.75	2.6	2.9	0.3
Time taken to deliver bibliography	2.60	2.4	2.8	0.4
Length of bibliography	2.40	2.2	2.6	0.4
Value of bibliography itself	2.20	1.9	2.5	0.6
Materials located via bibliography	2.20	1.9	2.5	0.6

00067

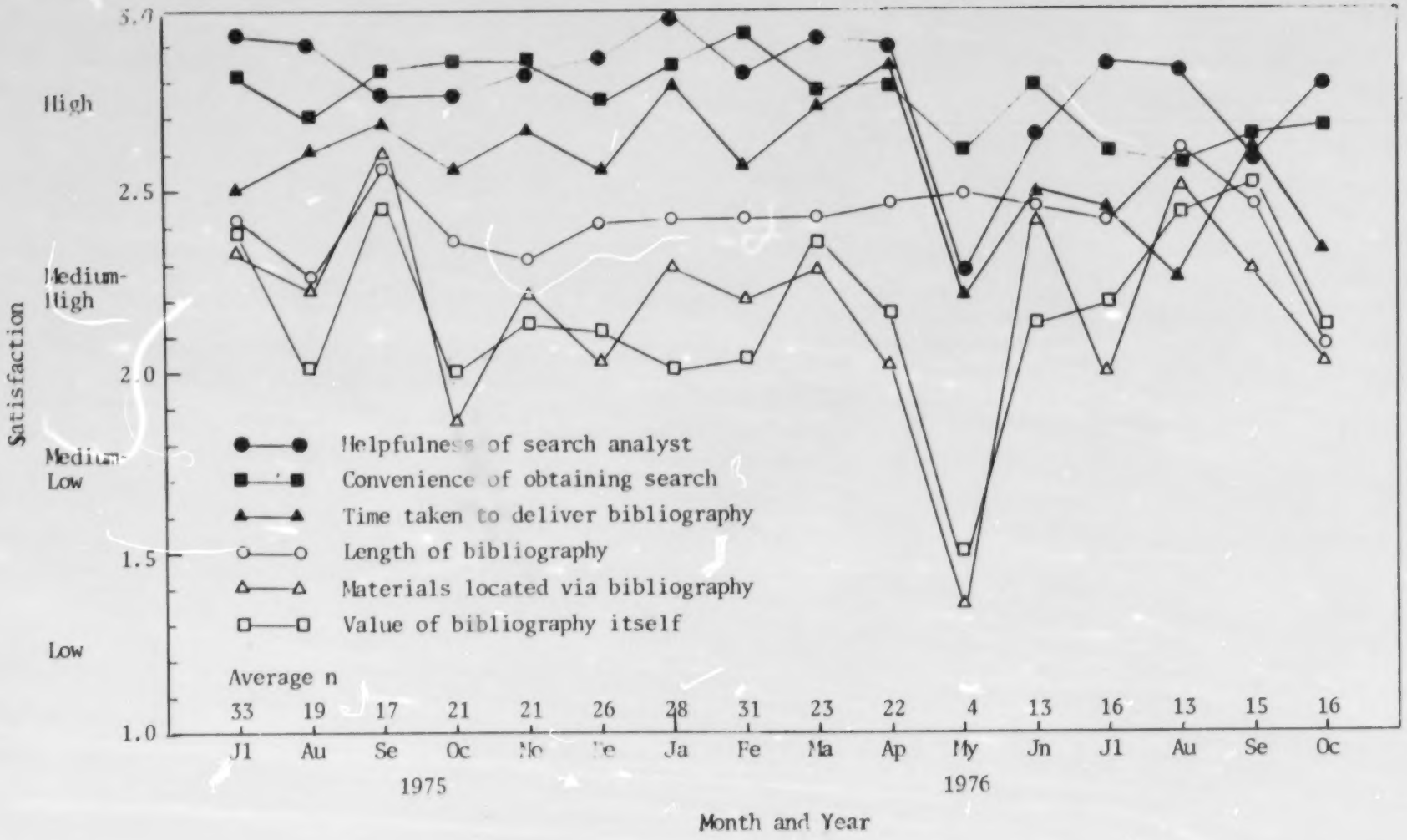
Corrective action could then be taken if the bounds are exceeded. There is one scale for which standards set in this way may be too low; namely measuring the quality of bibliographies and materials. An understanding of the factors affecting this variable must be achieved in order to determine if it is possible to raise its level. A first step in this is analyzing the trends of individual scale items.

Figure 4 displays trends in monthly averages for six items that relate directly to the user's satisfaction with performance of the EISO search service: helpfulness of search analyst, convenience of obtaining search, time taken to deliver bibliography, length of bibliography, value of bibliography itself, and materials located via bibliography. The trends reveal that satisfaction with EISO's search analyst is very stable, except for a drop in May 1976, as is satisfaction with the convenience of requesting an EISO literature search. Satisfaction with the amount of time taken to deliver the bibliography, however, has not fully recovered from a drop in May. This drop may in part be accounted for by the delays imposed by the use of the Lockheed system, which does not allow the search analyst to request that bibliographies be sent directly to the clients. Also, EISO has experienced backlogs during busy periods like October. It would appear from first-year data that average satisfaction levels for delivery times can and should be maintained in the 2.6 ± 0.2 range, and that this has not been consistently achieved in the latter half of 1976. If follow-up questionnaires now being returned from non-respondents confirm this fact, then this area will warrant further investigation and action.

Satisfaction with the length of bibliographies has been consistently in the 2.4 ± 0.2 range, except for October when the service experienced exceedingly high demand. At that time, a decision was taken to counter the reduced time available for planning search strategies by providing longer bibliographies. That is, rather than placing additional conditions on the search strategy in order to increase precision and decrease the number of citations, searches were conducted at a more general level. As a result, the average number of citations climbed from 82 in August and September to 134 in October. Clients had to cull through more citations in order to locate relevant documents, and it appears that this task was sufficiently difficult and time consuming to reduce their satisfaction with the length of bibliographies. Assuming this analysis is correct, then it would appear that the client's satisfaction with the length of a bibliography is a factor that is sensitive to changes in EISO's practices,

C0068

FIGURE 4 -- AVERAGE USER SATISFACTION ON SELECTED ITEMS BY MONTH



and that the average length of bibliographies should be on the order of 75 citations with a maximum of 100 items, unless otherwise requested by the client.

Satisfaction with the value of the bibliography itself varied considerably from month to month, rising as high as 2.6 and falling as low as 1.4. In general, it fell within the range of 2.20 ± 0.3, and it appears that this is a range that could be considered as being acceptable, if it is considered as an initial standard for performance. It is notable that even in October, during the period when bibliographies tended to be too long, satisfaction with the bibliography itself remained within this range. At the same time, the high satisfaction level achieved in two months, September 1975 and August 1976, show that high levels of satisfaction can be achieved. With further investigation, it may be possible to locate factors which provide us the leverage needed to obtain consistently high results. In the meantime, the aforementioned standard will have to suffice.

Assessment of satisfaction with the materials located via the bibliography suggest that it, too, varies considerably from month to month, and tends to vary with the perceived value of the bibliography. The range observed is 2.2 ± 0.3, excluding May, and this range can be used as an initial standard.

A summary of initial standards for the six satisfaction items is given in Table 30. It should be emphasized that the standards are derived from actual results to date. Hence, they are realistic standards; it should be possible to maintain them. However, they do not necessarily represent the highest standards that it is possible to achieve. Additional research is necessary to determine what those may be.

The monthly data trends, analyzed on a point by point basis in the preceding section, can also be analyzed in terms of annual cycles. In all, data from two years are available for four months: July, August, September, and October. Ignoring effects that are due to system and personnel changes, we can ask whether or not there are cyclic changes. Taking this perspective, one feature is notable. In both years, September was a month during which clients were highly satisfied with the value of the bibliography and materials, while October's clients were relatively less satisfied. As usage statistics indicate (Table 47), in both years September was a relatively light month, while October was very busy. Hence, the volume of requests may in fact explain what is apparently a cyclic phenomena.

C0071

Summary

Analysis of user satisfaction data covering two years reveals that a consistently high level of service is being provided by EISO. Satisfaction is particularly high with the human elements of the system -- the helpfulness of the search analyst, convenience of the service, and quick delivery of materials. Clients express positive, though moderate, levels of satisfaction about the bibliographies and materials themselves. Analysis of trend data suggests that high levels of demand in peak months results in a moderate decline in the quality of the service. Two changes in the EISO service -- dependence on a different retrieval system and employment of a new search analyst -- may also account for changes in satisfaction levels. Preliminary analysis suggests that the effects due to use of Lockheed rather than SDC are negligible and that effects attributable to differences in search analysts are small. Though both search analysts provided a level of service that satisfied clients, the learning curve of the new search analyst was revealed in a steady increase in perceived quality of bibliographies retrieved during her first five months in the position.

Social Correlates of User Satisfaction

Several factors have been mentioned which might explain differences in the levels of satisfaction expressed by different individuals who have used EISO. For example, changes in the service's personnel and level of demand at the time a search is requested may be relevant factors. This section analyzes the relationship of a number of other factors with client satisfaction, including the user's location, organization and role, and the type of system used. As well, two important intervening variables are identified: the percentage of citations in the bibliography that are new to the user, and the number of articles or documents from the bibliography that the user actually reads.

Location

It was to be expected that the geographical location of clients would be a factor explaining their degree of satisfaction with those aspects of the EISO service that were related to their distance from Toronto, such as the time taken to deliver bibliographies and materials. Logically, one would think that those in Metro Toronto would be most satisfied,

C0807

others in Southern Ontario almost as satisfied and those in Northern Ontario least satisfied. The system used was also felt to be influential, since one system used (SDC) allows bibliographies to be sent directly to the user, while the other (LIS) does not.

Table 31, displaying the users' average level of satisfaction with the time taken to deliver bibliographies broken down by location, system, and year, indicates that location is an important factor as far as Northern Ontario users are concerned. They are less satisfied, on the whole, than

TABLE 31 -- SATISFACTION WITH TIME TO DELIVER BIBLIOGRAPHY BY LOCATION, SYSTEM, AND YEAR

Location	System					
	SDC			Lockheed		
	$\bar{X}$	s	n	$\bar{X}$	s	n
Metropolitan Toronto						
Year 1	2.65	0.67	83	2.67	0.53	39
Year 2	2.82	0.39	17	2.40	0.72	43
Southern Ontario						
Year 1	2.68	0.60	60	2.73	0.47	11
Year 2	2.83	0.39	12	2.59	0.57	27
Northern Ontario						
Year 1	2.50	0.72	27	2.33	0.58	3
Year 2	3.00	0	1	2.40	0.63	14

those in either Metro Toronto or the rest of Southern Ontario. The latter two groups are equally satisfied, and highly satisfied. The retrieval system used does not appear to be an important factor in the first year, though some differences are suggested in second-year data. However, in the latter cases, the system variable may be masking the effects of different search analysts, since most SDC searches were conducted earlier in the second year before the first search analyst resigned.

00073

The satisfaction of clients with the time taken to deliver materials from EISO in Toronto and ERIC Document Reproduction Services (EDRS) in the United States are contrasted in Table 32.

TABLE 32 -- SATISFACTION WITH TIME TO DELIVER EISO AND EDRS MATERIALS BY LOCATION AND YEAR

Location	Duplication Service					
	EISO			EDRS		
	$\bar{X}$	s	n	$\bar{X}$	s	n
Metropolitan Toronto						
Year 1	2.48	0.73	23	2.00	0.93	15
Year 2	2.79	0.43	14	2.21	0.70	14
Southern Ontario						
Year 1	2.45	0.76	20	2.64	0.67	11
Year 2	2.42	0.67	12	1.86	0.69	7
Northern Ontario						
Year 1	2.33	0.50	9	2.00	0.93	15
Year 2	2.00	0.82	7	2.33	0.52	6

On the whole, EISO provides better service than EDRS in Metro Toronto and Southern Ontario, while the two are perceived to be equally satisfactory in Northern Ontario. EISO's service in Metro Toronto has apparently improved in the past year, and remained consistent elsewhere.

In summary, it appears that there is a need to improve timeliness of service to Northern Ontario. In the short run, this means that EISO must make greater efforts; in the long run it may mean that Northern Ontario needs a search service of its own.

Organization

Are users in some organizations more satisfied with EISO than those in others? If so, what are the explanations and implications of such a finding? To answer these questions, data from EISO's first year were

00074

analyzed according to the organizations in which users were employed. The analysis was carried out in two stages. First, statistical tests were carried out to determine if significant differences existed between the average level of satisfaction on each of the six satisfaction scales for users grouped according to the type of organization in which they worked (Table 33). This analysis indicated that significant differences existed on only one scale: Quality of Service. The second stage of the analysis

TABLE 33 -- ANALYSIS OF VARIANCE TESTS OF SIGNIFICANCE FOR SATISFACTION OF FIRST-YEAR USERS BROKEN DOWN BY ORGANIZATION

Scale	$d.f._b$	$d.f._w$	F-ratio	F-prob.
Publicity Materials and Directions	3	84	0.262	0.853
Quality of Service	3	195	2.144	0.095†
Timeliness of Service	3	21	1.573	0.225
Quality of Technology	3	52	1.487	0.228
Value of Bibliography and Materials	3	129	1.158	0.328
Overall Satisfaction	3	175	1.350	0.259

†Significant at the .10 level.

consisted of testing pair-wise contrasts in order to determine between what types of organizations significant differences in levels of satisfaction occurred (Table 34). By this method it was determined that OISE users are, on the whole, more satisfied with the quality of service than those from school boards, though it should be noted that both groups were highly satisfied. In all probability, the convenience to OISE users of having the service in-house accounts for this finding.

The answers derived from first-year data have not yet been tested with second-year data. However, an initial analysis of the latter for Overall Satisfaction is given in Table 35. Though the relationship is not statistically significant, perhaps in part due to the large number of groups used and small size of the sample, it is again observed that satisfaction of OISE users is higher than that of board users.

C0975

TABLE 34 -- AVERAGE SATISFACTION OF FIRST-YEAR USERS WITH QUALITY OF SERVICE BROKEN DOWN BY ORGANIZATION

Organization	Statistics		
	$\bar{X}$	s	n
School Boards	2.74	0.68	76
Postsecondary Institutions	2.76	0.67	17
OISE	2.88	0.46	86
Other	2.81	0.74	20
Test for Significance $F_{3,195} = 2.144$	p-value = .095		
Test for significance of contrasts		p-value	
$\psi_{13} = \mu_1 - \mu_3$	t = -2.475	.014	

TABLE 35 -- AVERAGE OVERALL SATISFACTION OF SECOND-YEAR USERS GROUPED BY ORGANIZATION WITH WHICH THEY ARE PRIMARILY ASSOCIATED

Organization		Statistics		
		$\bar{X}$	s	n
Public Board	2.52	2.54	0.31	28
Separate Board	2.52	2.43	0.45	7
Postsecondary		2.52	0.36	21
Ministry of Education		2.60	0.67	2
OISE				
Academic	2.60	2.58	0.41	25
Research and Field Development	2.60	2.60	0.25	9
Library	2.60	2.80	0.28	2
Other		2.40	0	1
Test for Significance $F_{7,87} = .35$			n.s.	

C0076

As much as anything, the data for user satisfaction broken down by organizations suggest that an in-house system has an edge over an external system in providing good service. This fact is important in understanding the spreading popularity of on-line retrieval services discussed in Chapter 6.

We can be sure that if an internal service provides superior service and an equal quality of bibliographies to an external search service, then the user's preference will be for the internal service. Since most of EISO's users are external to OISE, this factor must be borne in mind when planning EISO's future.

Roles

Are users occupying certain roles more satisfied with EISO than those in other roles? If so, what accounts for these differences? In answering these two questions about the relationship between the client's role and level of satisfaction, first-year satisfaction data were analyzed much in the same way that had been used for investigating the relationship between organization and satisfaction. Table 36 presents statistical tests for the various dimensions of satisfaction broken down by role. Significant differences in satisfaction among users in different roles were found for two scales: Publicity Materials and Directions, and Quality of Technology.

TABLE 36 -- ANALYSIS OF VARIANCE TESTS OF SIGNIFICANCE FOR SATISFACTION OF FIRST-YEAR USERS BROKEN DOWN BY PRIMARY ROLE

Scale	$d.f._b$	$d.f._w$	F-ratio	F-prob.
Publicity Materials and Directions	4	83	2.562	0.044†
Quality of Service	4	195	1.562	0.185
Timeliness of Service	4	20	0.424	0.791
Quality of Technology	4	51	2.713	0.040†
Value of Bibliography and Materials	4	128	0.864	0.489
Overall Satisfaction	4	175	0.538	0.711

†Significant at the .05 level.

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Researchers and individuals involved in field development had the most positive opinion about publicity materials and directions; their assessment was closely followed by those involved in teaching, no doubt many of whom were in postsecondary institutions. These groups, on the whole, had a significantly higher level of satisfaction than did administrators and graduate students (Table 37). One could infer that researchers, field development personnel, and teachers were more knowledgeable about information resources initially and therefore found the materials easy to

TABLE 37 -- AVERAGE SATISFACTION OF FIRST-YEAR USERS WITH PUBLICITY MATERIALS AND DIRECTIONS BROKEN DOWN BY PRIMARY ROLE

Role	Statistics		
	$\bar{X}$	s	n
Administration	2.38	1.36	20
Teaching	2.63	0.65	19
Research and Field Development	2.75	0.67	21
Graduate Studies	2.41	1.11	19
Other	2.78	0.68	9

Test for significance $F_{4,83} = 2.562$ p-value = .044

Tests for significance of contrasts

		p-value
$\psi_{12} = \mu_1 - \mu_2$	t = -2.480	.015
$\psi_{14} = \mu_1 - \mu_4$	t = -2.073	.041
$\psi_{34} = \mu_3 - \mu_4$	t = 2.233	.028
$\psi_{45} = \mu_4 - \mu_5$	t = -1.889	.062

00078

understand. In contrast, newcomers to the field, many of whom were no doubt unfamiliar even with ERIC, would have found the materials more difficult to understand and, hence, less satisfactory. This finding suggests that a different approach may be needed for recruiting clients, especially from among administrators in school boards. Clearly, further analysis breaking down satisfaction by role and organization is needed.

Satisfaction with the quality of EISO technology was highest among graduate students and lowest among administrators (Table 38). It may well be that the graduate students' direct access to the search service, all ERIC microfiches and journals, microfiche readers, etc. help to explain the difference.

TABLE 38 -- AVERAGE SATISFACTION OF FIRST-YEAR USERS WITH QUALITY OF TECHNOLOGY BROKEN DOWN BY PRIMARY ROLE

Role	Statistics		
	$\bar{Y}$	s	n
Administration	2.26	0.58	13
Teaching	2.48	0.81	14
Research and Field Development	2.37	0.84	10
Graduate Studies	2.64	0.74	15
Other	2.00	0	4
Test for significance	$F_{4,51} = 2.713$	p-value = .040	
Tests for significance of contrasts			
			p-value
$\psi_{14} = \mu_1 - \mu_4$	t = -2.459		.017

Initial analysis of second-year data for Overall Satisfaction does not reveal any striking differences when broken down by either the users' primary role (Table 39) or the role in which the bibliography was requested (Table 40). This suggests that there is no one group whose needs should be addressed above and beyond the others.

TABLE 39 -- AVERAGE OVERALL SATISFACTION OF SECOND-YEAR USERS GROUPED ACCORDING TO THEIR PRIMARY ROLES

Role	Statistics		
	$\bar{X}$	s	n
Administration and Supervision	2.50	0.34	36
Teaching or Pupil Personnel	2.56	0.37	17
Research	2.66	0.31	11
2.63			
Field Development	2.57	0.29	7
Library	2.80	0.20	5
Master's Students	2.40	0.43	4
2.53			
Doctoral Students	2.58	0.50	10
Other	2.44	0.30	5
Test for significance	$F_{7,87} = .77$ n.s.		

TABLE 40 -- AVERAGE OVERALL SATISFACTION OF SECOND-YEAR USERS GROUPED ACCORDING TO THE ROLE IN WHICH THEY REQUESTED SEARCH

Role		Statistics		
		$\bar{X}$	s	n
Administration and Supervision		2.53	0.31	19
Teaching or Pupil Personnel		--	--	--
Research	2.57	2.59	0.32	33
Field Development		2.47	0.21	6
Library		2.87	0.23	3
Master's Students	2.53	2.54	0.40	10
Doctoral Students		2.52	0.48	17
Other		2.46	0.36	7
Test for significance	$F_{6,88} = .62$ n.s.			

Summary

The ease of access that clients have to EISO appears to be an important factor in explaining their differences in levels of satisfaction. Those who are close to the service, especially those holding positions in the OISE building, tend to be more satisfied with the service than those in distant locations. Also, those who hold positions in which administrative rather than academic concerns are of importance tend to be somewhat less satisfied with the time taken to deliver bibliographies, the quality of publicity materials, and the quality of the technology used. Yet, it should be emphasized that, on the whole, users expressed medium-high to high levels of satisfaction about all aspects of EISO, regardless of their location, organization, or role.

Intervening Variables

User characteristics like location, organization and role, and search service traits like the retrieval system used and the identity of the search analyst, are all input variables, and by themselves cannot be expected to explain all the variation in user satisfaction. Process variables such as the user's retrieval of documents and acquisition of knowledge may be of equal or greater importance. One would expect that the individual who undertakes the review of a large number of articles and who learns a great deal of new information will be more positively disposed to the search than one who has not. In the second year, two of these intervening process variables were measured: the amount of material located via an EISO bibliography that the client actually read, and the percentage of the material on the bibliography that was new to him. Table 41 provides a breakdown of user satisfaction on all five subscales plus the overall scale according to the number of documents or journal articles that were read.

For three of the scales, the differences among means are significant: Quality of Service, Value of the Bibliography and Materials, and Overall Satisfaction. The second of these is clearly the most important factor among the five in terms of user satisfaction. Those who read original material for no more than five references expressed a medium-low level of satisfaction with the value of the bibliography and materials, while those reading over 21 expressed very high satisfaction.

C0082

TABLE 41 -- AVERAGE SATISFACTION OF YEAR-TWO USERS ON SIX SCALES BROKEN DOWN BY NUMBER OF REFERENCES READ

Scale	Materials Read				
	0-5	6-10	11-20	21+	Sig.
Publicity Materials	2.54	2.39	2.59	2.54	n.s.
Quality of Service	2.61	2.72	2.83	2.83	.10
Timeliness of Service	2.33	2.29	2.50	2.50	n.s.
Quality of Technology	2.48	2.42	2.33	2.59	n.s.
Value of Bibliography and Materials	1.85	2.00	2.40	2.72	.05
Overall Satisfaction	2.47	2.43	2.61	2.74	.05

But is reading references enough? Is it not equally important to question whether or not the material is new? Table 42 presents an answer to this question, and suggests that there are other influences on

TABLE 42 -- AVERAGE SATISFACTION OF YEAR-TWO USERS ON SIX SCALES BROKEN DOWN BY PERCENTAGE OF MATERIAL THAT WAS NEW

Scale	Percentage of New Information				
	0%	10-20%	21-50%	50+%	Sig.
Publicity Materials	2.48	2.53	2.41	2.67	n.s.
Quality of Service	2.75	2.73	2.71	2.82	n.s.
Timeliness of Service	--	--	2.33	--	--
Quality of Technology	2.11	2.41	2.43	2.62	n.s.
Value of Bibliography and Materials	1.13	1.91	2.50	2.53	.05
Overall Satisfaction	2.14	2.45	2.57	2.76	.05

00083

user satisfaction. Those reporting no new information were not satisfied with the value of the materials, those finding 10 to 20% new were satisfied, and those finding over 20% new materials were highly satisfied. This last finding suggests that it is only necessary to have one of every five references in a bibliography that are new and relevant to the client in order for him to be highly satisfied.

An additional factor that might be related to satisfaction with the value of a bibliography is the data base searched. That is, we must determine which of the major data bases are best at satisfying clients' information needs. Differences in levels of satisfaction observed among the users of ERIC, *Psychological Abstracts*, and *Social Sciences Citation Index* (*SSCI*) are reported in Table 43. Again, it is primarily on the

TABLE 43 -- AVERAGE SATISFACTION OF YEAR-TWO USERS ON SIX SCALES BROKEN DOWN BY DATA BASE USED

Scale	Data Base Searched			
	ERIC	*Psychological Abstracts*	*SSCI*	Sig.
Publicity Materials	2.55	2.54	2.08	n.s.
Quality of Service	2.74	2.65	2.63	n.s.
Timeliness of Service	2.38	--	--	--
Quality of Technology	2.47	--	--	--
Value of Bibliography and Materials	2.30	1.78	1.67	.10
Overall Satisfaction	2.60	2.31	2.15	.05

Value of Bibliography and Materials that significant differences are observed. Clearly, second-year customers have been more satisfied with ERIC bibliographies than those from *Psychological Abstracts* and *SSCI*. Either these two data bases are less relevant to clients' needs, or we are not able to search them effectively. Certainly, further investigation of the low levels of satisfaction reported by users of *Psychological Abstracts* and *SSCI* are warranted.

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Correlates of Intervening Variables

Discovering correlates of the two intervening variables -- number of documents read and percentage of references that are new to the user -- might provide insight into how one can increase the user's satisfaction with the value of the bibliography and materials. There are at least two technological variables that are possibilities: the system used and the data base searched. As to the former, it has been noted elsewhere that the ability to string search on the Lockheed system had made it the system preferred by the search analysts. But is it really better? As for the second, we have already seen that ERIC is currently the preferred data base; we now wish to see if it is preferred because it provides bibliographies with more citations for which the users read the original materials.

The system and data base used are related to the Number of References Read in Table 44, where the latter variable is placed on a four-point scale.

TABLE 44 -- NUMBER OF REFERENCES READ BROKEN DOWN BY SYSTEM AND DATA BASE

Data Base	System					
	SDC			Lockheed		
	$\bar{X}$	s	n	$\bar{X}$	s	n
ERIC	2.76†	1.22	29	2.22†	1.12	63
Psychological Abstracts	--	--	--	2.72	1.01	11
SSCI	--	--	--	2.25	1.26	4

†Average on a four-point scale: 1 = 0-5; 2 = 6-10; 3 = 11-20; and 4 = 21+.

The average scale value for search of the ERIC data base conducted on SDC is 2.76, which translates into about 13 articles or documents that were read by the user, if one interpolates between the midpoints of the intervals. Searches of ERIC on Lockheed, however, apparently provided an average of only nine references for which the clients obtained and read the original materials.

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Ideally, the relative effectiveness of the SDC and Lockheed search systems could be assessed by comparing the results for searches of ERIC which were carried out using each of the two systems. Drawing upon the data from Table 44, such a comparison would suggest that SDC's ORBIT is the better system since it retrieved more references to relevant documents than did Lockheed's DIALOG. However, we consider this conclusion unwarranted since we know that most SDC and Lockheed searches were conducted by different search analysts. Further analysis and experimentation will be necessary to control for the effects due to different search analysts if we are to judge the two fairly. At the same time, the data in Table 44 does provide evidence that DIALOG's greater technical capabilities do not give it an overwhelming edge over ORBIT in retrieving relevant documents from ERIC. This finding runs contrary to the opinion of many in the field of information science, some of whom may place too great an emphasis on technical rather than human factors.

Searches of *Psychological Abstracts* and the *Social Sciences Citation Index* were limited to the Lockheed system since they are not available from SDC. On the average, approximately 13 references from *Psychological Abstracts* and nine from *SSCI* were relevant.

More important than the number of articles and documents that clients read is whether or not the materials contained information that was new to them. Table 45 reveals that, regardless of the system employed, the user who requested an ERIC search was likely to find that about 30% of the references provided new information. These results again confirm that there is probably little appreciable difference between the effectiveness of the SDC and Lockheed systems.

Searches of *Psychological Abstracts* and *SSCI* retrieved a smaller percentage of materials that were new to the users than was true for searches of ERIC. For *Psychological Abstracts*, only 20% of the materials were new, on the average, and for *SSCI* only 15%. All of these searches, which were rather few in number, were done using DIALOG since these data bases are not available from SDC. Indeed, it would appear that the main advantage that DIALOG offers is not its technical capabilities, but its selection of data bases.

Several insights are provided by the preceding analysis which focused on the relationship between two technological variables, the system used and the data base searched, with two intervening variables, the number of documents or articles that users read and the percentage

C0086

TABLE 45 -- PERCENTAGE OF MATERIAL THAT WAS NEW BROKEN DOWN BY SYSTEM AND DATA BASE

Data Base	System					
	SDC			Lockheed		
	$\bar{X}$	s	n	$\bar{X}$	s	n
ERIC	2.73†	1.11	30	2.79†	0.88	63
Psychological Abstracts	--	--	--	2.40	0.84	10
SSCI	--	--	--	2.00	0	4

†Average on a four-point scale: 1 = 0%; 2 = 10-20%; 3 = 21-50%; and 4 = 50+%.

of these which contained information that was new to them. The latter two variables, it will be recalled, were strongly related to the satisfaction users expressed about the value of the bibliography and materials.

First, it appears that the system selected for a search is of little importance as far as clients are concerned. SDC's ORBIT and Lockheed's DIALOG are equally effective. Approximately one-third of the citations from bibliographies done on either system provide the user with new information and, as we have seen earlier, this is a sufficient percentage to leave the user reasonably satisfied.

Second, while users report that they found as many references on *Psychological Abstracts* and *SSCI* bibliographies for which the original materials were worth reading as they did on ERIC bibliographies, a considerably smaller percentage of these materials provided them with new information. It would appear that this relative lack of new information accounts for the lower level of satisfaction observed for searches of *Psychological Abstracts* and *SSCI*.

Conclusion

Educators who have tried the Educational Information System for Ontario during the past two years have been quite satisfied with the results. Most are particularly pleased with the helpfulness of the search analyst and the convenience of the service, and are basically satisfied with the

CC087

timeliness of the service and the quality of the bibliographies and materials it provides. The quality of EISO's services has been maintained in spite of the many changes that have occurred in the two years since EISO was started. Among the most important of these changes are the hiring of a new search analyst upon the resignation of the first, the utilization of a different computerized search service from that originally used, and the searching of data bases that originally were not available. In addition, new publicity materials, teaching materials, business forms and evaluation questionnaires have replaced the original versions.

Data collected to date allow us to suggest some standards for user satisfaction that should be maintained in the future. We expect that periodic assessments of the service will continue to be conducted in order to ensure that the service's high quality is maintained. Though the initial values for these standards, given in Table 30, are but approximate, we feel that the satisfaction scales are sufficiently valid and reliable for them to be used for assessing the effect of many changes in the service that may occur or that might be undertaken in order to improve its quality. As well, regular monitoring of the service would provide feedback to the search analyst to indicated areas that might be in need of improvement.

Analysis of data covering two years revealed at least one factor that may lessen EISO's ability to maintain the quality of its service on a month to month basis. It was observed that during peak months when over 50 searches were completed, the quality of bibliographies apparently began to suffer. In both 1975 and 1976, user satisfaction dropped in October, when demand was highest.

Satisfaction with the service varied according to a number of social factors, including the geographical location, organization and role of the EISO client. Those from geographical locations remote from Toronto were less satisfied with the service in general, and its timeliness in particular, than were those from Southern Ontario and Metro Toronto. Those located in the OISE building itself were most satisfied, largely because the service was so convenient. Researchers and those active in field development were more satisfied with EISO's publicity material and directions for using the service than were either those in school boards or graduate students. Apparently, knowledge about information resources in general, and ERIC in particular, is an important factor in explaining this relationship.

00988

Satisfaction with the bibliography and materials was positively related to both the number of citations for which users read the original materials and the percentage of references that contained new information. Though it was thought that the system used in conducting a search might account for this finding, this was not the case. Lockheed's DIALOG and SDC's ORBIT proved equally effective, though the former does have the advantage of providing access to a wider selection of data bases. The data base on which a search was run did prove to be important in explaining the relationship. Searches on *Psychological Abstracts* and *SSCI* did not provide clients with as large a percentage of new information as did ERIC searches. This lack of new and relevant material resulted in a low level of user satisfaction for searches done on these data bases.

The findings outlined above imply that EISO should focus its efforts on maintaining the quality of bibliographies that are run on ERIC, and upon either increasing the quality of those run on other data bases or being more selective in recommending searches on these data bases. At the same time, EISO should work to improve the timeliness of its service to those located in Northern Ontario.

Maintaining and improving the quality of EISO's service is important, but is it equally important to learn if its work is contributing to the development of education in Ontario. To assess its impact in a preliminary way, several case studies of the utilization of EISO materials were undertaken. These are the subject of the next chapter.

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CHAPTER 4

Impact of EISO on a School Board

No matter how efficient and sophisticated a service such as EISO is in itself, its ultimate importance will be judged largely in terms of the satisfaction of its users and the impact it has on them. Some of the satisfaction variables have already been analyzed. Now it is time to look at whether EISO does in fact effect the conduct of education in the schools. Since it is virtually impossible because of practical limitations to study the long-term, indirect impact of EISO on students, the researchers, cognizant of the importance of this issue nonetheless, decided to examine the more immediate and indirect impact of EISO on users within one school board. To do this, they interviewed the Director, a coordinator, a principal, and a teacher all of whom were EISO users within a single board in the Northeastern Region of Ontario.

The Director

The Region 3 school board under consideration is a rural one with a total population of about 5,000 students. English is the mother tongue of the majority. The Director is an experienced educator, an active participant in professional organizations, and an innovative leader. Within the past eighteen months, he has used the EISO service twice. Each time the search was initiated for his own professional use. Why did he use EISO? What did he get from it? What impact did it have?

Search Request #1

A little over a year ago, his board formed a committee of trustees, teachers, and parents to prepare a brief to be submitted to the Royal Commission on Violence in the Communications Industry. The committee expressed the need

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for current literature on the topic and looked to their chief executive officer to fill that need. He remembered hearing about EISO at an introductory meeting held the preceding summer at the Regional Office of the Ministry of Education and had since committed one of his staff to act as an intermediary between local users and the EISO service in Toronto. He also knew that he had five free searches available to him and had even set aside some monies for staff searches, in case the free searches were exhausted. Therefore, because he had been involved in implementing the service in the Region and his board from its earliest stages, it was natural for him to turn to EISO to acquire literature on a topic of concern to him. His immediate motivation, however, was the request for assistance from his board's committee.

He submitted a written request to EISO on the specially printed search request forms prepared for Region 3 users. Upon receiving his request, the search analyst telephoned him to acquire some more specific information. She ascertained that he was interested in work that had appeared since 1970 on the effect of television violence on students' attitudes in Grades 1 through 6. The analyst formulated a search strategy, using the major concepts of violence, television, and student attitudes, and requested that a bibliography with 38 citations be printed off-line and sent to the Director. After scanning the citations and their abstracts, he ordered the original articles, had them duplicated, and handed them over to the chairman of the committee, who distributed them to the other committee members.

The board's committee on TV violence did submit a well-documented brief to the Royal Commission. In addition to supplying the committee with background information, the Director described the benefits of the search this way:

> As they read some of the documents that I was able to provide for them, the committee could see that some pretty important people espouse the same beliefs that we're espousing here. The board members and staff members who worked on that committee were very satisfied with the search.

The impact of the second search was equally significant, perhaps more so, since it was a real factor in the decision to retain the existing Kindergarten program in the system.

C0091

Search Request #2

Just over a month after submitting the first search, the Director was again approached for help by a board committee. This time the trustees were interested in comparing the efficacy of the existing Kindergarten program with alternative programs. The Director, therefore, submitted a request for an EISO search on the comparative effects of the various approaches to the organization of a Kindergarten program (i.e., full day, half day, modified full day, etc.) on student achievement and also on parental and community approval.

As before, the search analyst spoke by phone to the Director to elicit precisely the aspects of the topic in which he was most interested. She was able to formulate a search strategy combining appropriate combinations of descriptors such as academic achievement, success factors, continuous progress plan, and program evaluation with the central concept of Kindergarten to ensure the relevance of the bibliography, which contained 49 citations, was printed off-line and sent to the Director. The request was received, the telephone interview was conducted, and the search was run on the same day. The bibliography was on the Director's desk nine days later. Interestingly enough, one of the citations was a study of Kindergartens that the Director and his staff had done several years earlier. Unfortunately, however, the mail strike in progress at the time prevented the Director from ordering any original materials.

The impact of this search was subtle but important. According to the Director, it had the following effect:

> The search gave confidence to the people who were using it. The fact that our own material was listed as being a valid and useful document [helped] us with our second Kindergarten investigation . . . . The fact that there had not been that much more research done in the four years since we had done the last one assured them that things were not changing too much and that they were up to date.

In addition to whatever new ideas the search may have presented them, it served to enhance the importance of the staff's earlier research; it helped to confirm the original decision regarding Kindergartens that had been taken; it contributed to upholding that program; and it helped legitimate the Director's position with his trustees, since they decided to continue supporting a program he advocated.

00092

The Coordinator

The coordinator who is the subject of this report is one of four people in his board responsible for curriculum development. The specific subject areas over which he exercises responsibility are mathematics, environmental science, and music. A former elementary school principal, he has held his current position for two years. He differs from the other three users in his board who are being described in this section of our report in that he alone among them also fulfills the role of an Educational Information Consultant (EIC) for the EISO project. In addition to being instrumental in stimulating use of the bibliographic retrieval system among the staff in his board, however, he also placed one personal search that was directly related to his own professional activities. It is his role as a user, then, that will be detailed here rather than his functions as an EIC, though it is of course recognized that the impact of EISO on the school board is intimately related to and indeed may be inseparable from the part he played as an EIC.

Search Request

When P1J1 first came out, the supervisory staff and teachers at the school board held a series of meetings to determine priorities for curriculum development in the system that would meet the objectives of the new Ministry guideline. Added to the requirements of P1J1 was the pressure exerted by parents and teachers to come up with a consistent mathematics curriculum that would ensure the computational skills of the students completing it. Finally, the coordinator, a math specialist himself, was advocating a problem-solving approach to mathematics teaching in the elementary grades. This approach meant, as he explained it,

> viewing mathematics as a model of real life whereby the child could order abstract information into some kind of a frame that would allow him to make order out of the chaotic nature of the data presented to him.

With these needs in mind, then, the coordinator mailed in a request to the analyst for the 100 most recent citations on mathematics problem solving, conceptions, teaching methodology, and skill sequences for Grades K-8. His direct reason for requesting the search was to compare current project ideas with the latest literature for possible modification of the board's existing math curriculum. Upon receipt of the request, the search

C0093

analyst formulated a search strategy using synonymous terms for the major concepts that she suggested were potentially the most useful: elementary education, mathematics, and teaching techniques. She ran it the next day. Within a week the coordinator received a bibliography of 48 citations.

After careful scanning of the abstracts, he placed an order with EISO for paper copies of 16 journal articles and one ERIC document on microfiche. He also ordered one listed dissertation from Xerox University Microfilms in Ann Arbor, Michigan. Although, after examining the content of the original materials, he came to the conclusion that only the dissertation was directly related to what he was doing, he nevertheless rated his overall satisfaction with the search as high. What then can we say resulted from this search? For one thing, the coordinator gained some satisfaction and pride from the realization that he was breaking new ground in an area that had received very little attention in the literature. On the other hand, the dissertation that he did find provided just enough confirmation that his approach was valid to encourage him to carry on. His perseverance, bolstered by his search, is resulting in maintaining an innovative approach to teaching mathematics in Grades K-8 in this system.

The Principal

The introduction of P1J1 resulted in a flurry of curriculum development activity. In trying to organize themselves to cope with the new guidelines, the teaching staff of the school board set priorities for those curricular areas that they would deal with first. Some of the activity resulted in a reexamination of the mathematics program. Just as important in the minds of both parents and teachers was the area of communications or language arts. Whereas teachers at the secondary level lamented their students' inability to write effective English, teachers at the primary level were concerned with the students' lack of ability in the listening skills area. The staffs of twinned junior public schools were especially interested that something be done to improve the childrens' skills and they left the matter to their principal to come up with suggestions for a program that they could try out.

The principal contacted the board's special education and language consultants but they were unable to provide him with help in this area. He then checked with nearby public and university libraries and found that there was very little material available on his topic and that what existed was so limited in scope that it gave him no basis from which to start.

C0094

Search Request

One day, the principal mentioned his problem to the coordinator who suggested he do an EISO search. The coordinator, an EIC on the EISO project, came to the principal's office the next day. They spent two hours discussing the problem, breaking it down into its various components, and choosing descriptors. The following day, the coordinator, in Toronto on business, stopped in to relay the request to the search analyst. She formulated the search strategy, and retrieved a bibliography of 33 citations on listening and comprehension skills in the primary grades. The bibliography was mailed to the coordinator. He delivered it to the principal who then ordered 12 microfiche documents and two journal articles listed on it from EISO. These items he received within a week of placing his order. Although not all of the information was relevant to his situation, the principal described what he learned from the materials this way:

> Some things that we found in the research articles and microfiches gave us hope or encouraged us to keep going. For example, a study done in the Detroit Public Schools showed that the emphasis placed in the classroom on listening is about 8% compared to 52% on reading. The same study showed that during the average working day of an adult, 9% of the time is involved with writing, about 16% with reading, and about 30% talking, and 45% listening. So with this kind of information, we felt we couldn't give up. If listening occupied that amount of time, then we had to do something, we just couldn't let it go.

The principal persevered for more than a year. He informed his staff of his findings, assured them that the area of listening was indeed an important though neglected one, and gained their commitment so that they devoted a series of professional development days to developing what resulted in a listening curriculum for Grades 1-3.

Much of the content of that curriculum, the principal freely acknowledges, derives from the fiche materials he received through EISO. That curriculum is still being modified and refined. It is, however, an integral part of the learning experience of 275 primary children.

The Teacher

The development of new curricula was not restricted to the primary level, however. At the large, modern high school of the board, a young but experienced teacher had just received Ministry of Education approval to

C0095

teach a psychology course that he had developed for Grade 11 students. His submission to the Ministry had consisted of philosophical and theoretical rationales for the course but had not included the compilation of detailed units of instruction to be used in the classroom over the whole semester. With the actual implementation of the course close at hand, such detailed curriculum planning became urgent. He described his predicament this way:

> My problems were that I could write the course up using reference material from basically college or university psychology text books. This was not the type of course I wanted to set up. I wanted to set up a course which was more growth oriented, which wasn't a sort of survey of the literature. And yet, there was no written material which justified [this conceptualization of] the course to which I could go to find some confirmation that it was a worthwhile endeavour. I had a good idea but every time I would go to a textbook to look for materials or previous courses set up that way, I was always up against a blank wall. It was getting to the point where I was getting so frustrated I was thinking of not doing it.

Search Request

At a departmental staff meeting in his school, the teacher mentioned his predicament to the local consultant who referred him to the coordinator, the EIC for the EISO project. The coordinator met with the teacher and spent more than an hour with him defining his information needs. Because by now time was of the essence, he phoned in the search to the analyst the next morning. She was able to retrieve 63 citations and nine days later the teacher visited OISE to examine some of the materials listed. The search analyst discussed the bibliography with the teacher and of her own initiative decided to run a second search in an effort to supply the client with material that would be useful to him. This second modified search, which retrieved 47 citations, was mailed to the teacher. Ironically, the most valuable items appeared on *both* bibliographies. The teacher was able to read 28 of the articles and microfiches while he was at OISE. Of these, he found that his first bibliography had nine items that were highly relevant and read through five of these. He rated his satisfaction with the value of the bibliography and the materials as high:

> It helped me justify the fact that there are other people in the world who are doing what I was planning on doing

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and it gave me their plan of attack, both for the development and implementation of the course.

He went on to say that he was certain he would be ordering more materials from EISO as he progressed toward writing up the final units of the course.

Conclusion

It would be imprudent to make exaggerated claims for the impact of EISO in this board. Undoubtedly it could be said that the board would have submitted a brief to the Royal Commission anyway, that the innovative but controversial Kindergarten and mathematics programs would have been retained regardless, or that the listening skills or psychology courses would have proceeded without EISO. We do know, however, that in the decision-making process, there comes a time when alternatives must be considered, and a final selection chosen. In the examples above, EISO bibliographies and materials clearly contributed to the knowledge base upon which rational decisions were taken. Not only did EISO act as a source of new information, it also provided alternatives, acted as an encouragement to struggling but well-meaning educators, and provided concrete examples of how to improve and implement curriculum programs. We can, then, say with some confidence that EISO had a direct, short-range impact on this board and its staff. We can only speculate about the ultimate impact of their decisions upon the children in the system, but we are reluctant to suppose that decisions taken by less well-informed staff would have achieved better results.

C0097

CHAPTER 5

Economics of Operation

In this time of economic stringency, the cost of operating the Educational Information System for Ontario is as important a factor as its effectiveness in filling the need that educators have for information. Responsible planning for EISO's future requires that realistic estimates of its full cost and its cost per client served be available in order to make judgements concerning policy matters such as its future expansion and pricing system.

In the first *Interim Report*, a theoretical model for the cost of an information service was presented that was based on the best information then available. Included in the model was an estimate of the cost of an average search. At that time, a volume of 135 searches per month was considered a possible objective for a small search service composed of one search analyst and one library assistant, and analysis indicated that such a search service would break even if a price of $36 was set for each search. Two years of experience have now provided sufficient data for a reassessment of this theoretical model. From data that have been collected, new estimates can be derived for parameters such as the number of searches per month and the amount of time required for each search. Substitution of these for earlier, more speculative values yield model budgets which form a better basis for planning and developing an educational information service.

For the analysis that follows, the budget of the Educational Information System for Ontario is divided according to its two principal activities, a bibliographic search service, and an article and microfiche duplication service. The costs of each are analyzed according to fixed costs, including overhead, and variable costs. Models for the search service are presented which provide estimates of costs per year and per month for

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systems which operate at different levels of demand, which use different amounts of computer time to complete searches, and which provide bibliographies of different lengths. An assessment is made of the relative impact of these three parameters on the economics of the system's operation, and of the financial impact of employing a second search analyst. Model budgets for the duplication service are also provided in order to illustrate the impact of volume of orders on unit prices.

Cost of Inputs

The costs of operating EISO can be broken down according to those incurred for communication and data processing, staff, materials and supplies, capital, and overhead. In the sections that follow, the cost of individual items classified under each of these categories are described for both the search service and duplication service. Subsequently, detailed analysis of the total cost for both services are undertaken.

Communication and Data Processing

Lockheed Information System's DIALOG and System Development Corporation's ORBIT, the two main bibliographic search systems utilized by EISO, assess separate charges for the time users are connected to specific data bases and telecommunications networks, and for the number of citations that are printed (Table 46). Rates for the systems differ; e.g., SDC charges $35 per connect-hour for ERIC, while LIS charges $25, and SDC's charge for printed citations from ERIC is $.08 each, while LIS's charge is $.10 each. Telecommunications charges also differ, as do those for different data bases on a given system. ERIC is the least expensive data base available on both systems, while other data bases of interest to educators cost considerably more. For example, *Psychological Abstracts*, *Dissertation Abstracts*, and *Social Sciences Citation Index* (*SSCI*), all available only from LIS, currently cost $50, $55, and $70 per hour respectively.

The total amount EISO is charged for conducting a given search can be computed by totalling charges for the three components. For example, if a 15-minute search of ERIC were conducted on SDC's ORBIT to produce a 75-item bibliography, the charge for one-quarter hour of data base connect time at $35 per hour would be $8.75, the charge for one-quarter hour of telecommunications on the TYMSHARE network would be $2.50, and the charge for printing 75 citations, at $.08 per citation would be $6.00, for a total of $17.25, exclusive of staff and overhead.

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TABLE 46 -- CHARGES FOR TELECOMMUNICATION AND DATA BASE CONNECT-TIME AND PRINTING OF CITATIONS BY SYSTEM[1]

Item	LIS -- DIALOG	SDC -- ORBIT
Telecommunication		
TYMSHARE	$ 8.00/hour	$10.00/hour
TELENET	5.00/hour	--
Data Base[2]		
ERIC		
Connect-time	25.00/hour	35.00/hour
Citations	.10/citation	.08/citation
Psychological Abstracts		
Connect-time	50.00/hour	n/a
Citations	.10/citation	
SSCI		
Connect-time	70.00/hour	n/a
Citations	.10/citation	
Dissertation Abstracts		
Connect-time	55.00/hour	n/a
Citations	.12/citation	

[1]Figures as of January 01, 1977.

[2]Data base costs given for the four that are searched most frequently by EISO.

Ideally, one would like to be able to estimate the cost of this same search on Lockheed's DIALOG in order to determine which system is more efficient. Then it would be possible to make a rational selection between the two systems for searching ERIC. Unfortunately, it is difficult to compare the costs of searches done on one system with those done on the other because the systems differ in their responsiveness, with ORBIT being considerably faster than DIALOG. How much faster can be inferred from our experience during EISO's first year, during which the search analyst conducted 300 ERIC searches on ORBIT and 62 on DIALOG. The

C0100

average connect-time for searches using ORBIT was 10.58 minutes, compared with 15.42 minutes using DIALOG. Thus, it would appear that a search on DIALOG takes approximately 46% more time to complete than one on ORBIT. It should be emphasized that since these data were collected for the period July 1975 through March 1976, the situation may now differ, though our subjective impression is that it does not.

Applying the 46% adjustment to the data for the example above allows us to draw a comparison as to what Lockheed would have charged for the same search. Instead of 15 minutes connect-time, 21.90 minutes would have been required. At $25 per hour, this translates into a charge of $9.13 for data-base connect-time. Communications charges on TELENET would have been $1.85 and print charges would have been $7.50. The total charge would therefore be $18.48, or about 7% more than the cost on ORBIT.

For small volume users, the comparison would end here; however, Lockheed now offers users a monthly discount on data-base connect-time charges according to the connect-hours logged (Appendix D). Large volume users are entitled to an even greater discount if they sign a contract guaranteeing a minimum level of usage. Given EISO's current volume of searching on Lockheed (about 20 connect-hours per month), it can be expected that the discounted cost of searching ERIC on DIALOG will be approximately $18 per hour. Hence, the charges for data-base connect-time in the example above would be reduced to $6.66, and the total to $16.01, which is 7% less than the search would cost on ORBIT.

Overall, it appears neither system has a decisive advantage in terms of cost. Lockheed's discount system does favour use of that system alone, however, since the size of the discount increases with the number of hours the system is used. This mode of charging, combined with Lockheed's wider selection of data bases in the social sciences, gives it a decisive advantage over SDC as far as EISO is concerned.

Table 47 reports the actual cost to EISO of searches conducted by EISO during its two years, as well as the percentage of clients who paid for their searches. In the first year, an average of 52 searches were conducted per month. On the average each search required 12 minutes of connect-time to either ORBIT or DIALOG and resulted in a bibliography of 46 citations. In a typical month, 37 or 71% of the clients paid for their searches. During EISO's second year, an average of 36 searches were conducted per month. The average search required 25 minutes of connect-time and produced a bibliography of 88 items, and cost EISO $25 in charges for

C0101

TABLE 47 -- SEARCH VOLUME, AVERAGE COMPUTER COST, AND PERCENT PAID BY MONTH AND YEAR

Month and Year	Number of Searches	Average Connect-time (minutes)	Average Number of Citations	Average Cost to EISO	Paid	
					Number	%
Year 1						
June 1975	11	12	23	$11	5	45
July	70	12	45	14	49	70
August	37	10	47	13	28	76
September	38	9	47	12	29	76
October	55	15	49	17	40	73
November	52	17	48	22	40	77
December	65	7	43	16	--	--
January 1976	61	10	50	14	44	72
February	61	13	60	15	51	84
March	63	15	43	16	46	73
April	54	14	53	17	--	--
Average	52	12	46	15	37	71

TABLE 47 (Cont'd.)

Month and Year	Number of Searches	Average Connect-time (minutes)	Average Number of Citations	Average Cost to EISO	Paid	
					Number	%
Year 2						
May 1976	29	21	32	21	--	--
June	33	27	70	24	28	85
July	37	30	100	25	26	70
August	28	27	76	26	19	68
September	27	26	74	22	23	85
October	55	23	111	27	50	91
November	43	24	97	26	37	86
December	33	21	118	25	29	88
January 1977	34	26	106	27	32	94
February	44	27	94	24	40	91
Average	36	25	88	25	31	86

connect-time and print charges. Typically, 31 or 86% of the clients paid for their searches.

Data for the two years vary considerably. The differences are explained by several factors, including the use of different systems, the different styles of the two search analysts, and the reduction in number of free searches. However, for the purposes of this chapter, it is not the reasons for the differences that are important, but the impact of these variations on the cost of providing the search service. We shall return to this point later.

One final factor influencing costs of searching data bases should be noted; namely, the exchange rates of Canadian and U.S. currencies. With the recent (March 1977) decline in the value of the Canadian dollar to $.95 U.S., each of the figures in the preceding analysis should be increased by 5% to arrive at the charges in Canadian currency; i.e., to $18.11 Cdn. on ORBIT, and to $16.81 Cdn. for the discounted rate on DIALOG. If, as some predict, the value of the Canadian dollar drops to $.90 or $.85 U.S., then the charges would increase accordingly.

Staff Costs

The Educational Information System for Ontario is currently staffed with only two individuals, a search analyst who is classed as Librarian II, and a Library Assistant II. The search analyst's time is fully devoted to conducting searches and managing the service, whereas the library assistant's time is split between the provision of secretarial services to support the search service, and the operation of the article and microfiche duplicating services. Their salaries are approximately $13,500 and $7,500 annually, or $14,850 and $8,250 after including an additional 10% for fringe benefits. Hence, the salary bill for the search service is $18,975, including the full cost of the search analyst and half that of the library assistant. The salary cost for the duplication service is $4,125.

The cost per search of providing staff can be estimated several ways. At one extreme, the total cost of salaries can be divided by the total number of searches for a given period of time. In 1976, 524 searches were conducted; the cost per search for staff would therefore be $36.21. If only the search analyst's salary and fringe benefits were included, the figure would be $28.34. The lowest estimate of cost is obtained if only the time of the search analyst devoted to conducting search interviews,

C0106

planning search strategies, and running searches is included. In EISO's first year, the average time spent to interview clients was 25 minutes, followed by 12 minutes on the computer system, for a total of 37 minutes. At $7.43 per hour (including fringe benefits), this amounts to only $4.58. In the second year, when the search interview averaged 35 minutes and connect time 24 minutes, for a total of 59 minutes, the equivalent estimate of cost per search for the search analyst's time is $7.31.

It is our feeling that the full cost of the search analyst's salary and half the cost of the library assistant's salary should be included in the analysis of costs per search in order to fairly represent the full cost of providing searches. Only in this way can the cost of time required for demonstrations, training, administration, and vacations be fairly represented.

Materials and Supplies

EISO prints a large number of brochures and business forms in the course of a year (Appendices E-M). The printing of approximately 25,000 brochures, at $.04 each, costs $1,000 and 1,000 copies of each of the four multiple-copy order forms cost an additional $800, half of which is attributable to the search service and half to the duplication service. Additional expenses are incurred in preparing notices of changes in the system which are sent to clients, etc. We estimate the full cost of these to be $600, all of it attributable to the provision of searches.

Office supplies, including special paper used in the computer terminal, vary with the number of searches completed, as do costs for long-distance telephone calls for contacting clients, which we estimate average $1.00 per search. The cost of the direct outside line for use in connecting the terminal to the retrieval system is fixed, however, at $300 per year. Cost of postage for mailing brochures is approximately $360, while the cost of mailing bibliographies depends on the numbers of orders. Among these costs for materials and supplies, only those for brochures, order forms, a telephone line, and the mailing of brochures are fixed. The cost of supplies and printing for providing a duplication service for back-up materials are all variable, in that they depend on the number of orders. Supplies themselves cost approximately $.10 for microfiche duplicates and $.04 each for paper copies of journal articles.

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Capital Expenses

EISO has invested $3,700 in the purchase of a computer terminal for use in conducting searches on ORBIT and DIALOG, and $5,440 for a microfiche printer/processor in order to be able to provide copies of ERIC microfiche. The usual replacement cycle for equipment at OISE is five years; therefore, the equipment EISO uses has an imputed cost of $740 per year for the search service and $1,088 for the duplication service. A machine for photocopies of journal articles was made available by the Institute; therefore its cost is included in overhead.

Overhead and Total Fixed Costs

The standard estimate of overhead cost used at OISE is 25% of all budget items. Those items listed to this point -- staff, material and supplies, and capital -- total $22,375. Overhead costs of $5,594 should therefore be added, making the total fixed cost of EISO's search service $27,969 per year. This, in essence, is the full cost of offering the service even if no requests are received.

The overhead for the EISO duplication service is 25% of $5,613, which is the cost of staff, materials and supplies, and capital allocated for the purpose. Hence, the total fixed cost for the duplication service is $7,016.

Costing a Search Service

This section develops a series of models for estimating the cost of bibliographic search services that differ in several vital ways, such as the number of search analysts, the amount of computer connect-time used to complete a search, and the length of resulting bibliographies. The first step in carrying out this analysis is determining the fixed costs of search services with one and two search analysts, respectively. The second step is determining the costs of three different search services all of which have one search analyst but differ in the types of searches provided, and hence, in their variable costs. Finally, the analysis of variable costs is extended to a search service with two search analysts.

The monthly cost of a computerized search service is dependent upon both fixed costs, such as staff salaries, and variable costs, such as those related to the amount of computer time used and citations printed.

00198

The basic unit for the analysis of these costs is the individual search, and the object of this analysis is to determine the average cost of a search. Unfortunately, it is quite difficult to define exactly what a search is and to ensure that the definition is applied consistently.

The problems with defining the meaning of a search are suggested by Wanger, *et al.* (1976).

> Do most . . . [search analysts] consider a search to be the interrogation of one data base, or do they consider it to be the interrogation of as many data bases as are needed, or used, to satisfy one search request?
>
> Where does a search begin and end? For example, is logging-in time included? The entry of mailing information for an off-line printout? . . . head scratching time when the searcher is deciding what to do next?
>
> Does time "at the terminal" include periods when the searcher leaves the terminal to check a vocabulary guide or user manual? . . . .
>
> How many different terminal sessions are required to satisfy a single search request? Some . . . [search analysts] indicate that they may check their results with the . . . [client] as an intermediary step before finalizing the search, or that they offer to re-do the search if the . . . [client] feels that it is not exactly what he or she wants. Is the time for each additional terminal session considered as part of just one 'search"? (p. 82)

Regrettably the importance of the definition of what a search is, was not fully recognized at the beginning of EISO's activities, and a standard definition was not set until the second year. Now, a search is defined to be the composite of the search analyst's interview with the client, the work devoted to designing a search strategy, and the interaction with the computer system to locate materials, regardless of the number of data bases searched. A search must also be devoted to one topic, with the search analyst making the judgement as to when a change in topic occurs. For example, if an interview session devoted to a search on moral education at the elementary school level reveals the client is also interested in the deviant behaviour of elementary school children, then the search analyst would indicate to the client that since the second topic requires an entirely new search strategy, a second distinct search would have to be undertaken.

During EISO's first year, a somewhat looser definition of a search was used. Informal demonstration searches were counted among the searches conducted, and if a search required use of two different data bases, the

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search of each data base was counted separately. As a result, the record of the number of searches conducted during the first year is somewhat inflated in comparison to that for the second year, while the average time spent on the computer in the first year is probably underestimated since the amount of connect-time for each data base would have been recorded separately.

In spite of the difficulties in defining the meaning of a search and determining the length of time each search takes, the data that have been collected are sufficiently precise to be used as reasonable guides to the amount of time that is required for a typical search, and to the number of searches that can be reasonably conducted in one month. Also, the data for the number of references printed for each search are exact since they can be determined without ambiguity from the computer printout. Hence, we have a good basis for making reasonable estimates of the three basic parameters that determine the variable costs of operating a search service: computer connect-time, number of citations printed, and number of searches conducted per month.

The data for EISO's two years provide different estimates of these three parameters, however. As shown in Table 47, the average computer connect-time the first year was 12 minutes whereas it was 25 minutes the second year. Even restricting the time estimates to searches conducted on DIALOG provides widely varying estimates of the connect-time per search: 15 minutes for the first year and 25 minutes for the second. Judging from the different amounts of time spent on-line, it appears that the two search analysts had considerably different styles of operation. For this reason, the revised model of search-system costs includes several estimates of the average amount of computer connect-time used during a search. Three values were selected to represent what we believe to be the minimum, median, and maximum values one can expect. The values selected are 15, 20, and 30 minutes respectively.

The idea of using three different estimates of computer connect-time in the model rather than a single estimate is repeated for another parameter of interest, the average number of citations. The first value selected was 50 citations per search, which is the average length of bibliographies printed during EISO's first year. The other values were 75 and 100 citations, values which encompass the average length of bibliographies for EISO's second year, which was 88 citations.

C0110

For convenience, the first of the three models presented pairs bibliographies containing 50 citations with searches taking 15 minutes of connect-time; that is, it is assumed the average search required 15 minutes of connect-time and produced a bibliography with 50 citations. The second model pairs bibliographies of 75 citations with searches taking 20 minutes of connect-time; and the third model pairs bibliographies of 100 citations with searches taking 30 minutes of connect-time.

Each of the three models provides a picture of the economics of operating a search system that has fixed costs determined by the requirements for supplies, printing, capital, staff, and overhead, and variable costs determined by the average amount of time that is spent on-line and the average length of bibliography.

Fixed costs for operating a search service with one or two search analysts are reported in Table 48. The fixed costs for a service with one search analyst is $2,331 per month, that for a service with two search analysts is $3,878 per month. The latter is 66% greater than the former, indicating it is more economical to add a second search analyst to an existing service than to create a second search service. The savings would amount to 34% of the basic fixed cost, or $782 per month.

Variable costs and fixed costs for searches are added together in Table 49 to give total monthly costs for three search services each with one search analyst but using different amounts of computer time for each search and producing bibliographies of different lengths. Since the total cost varies with the number of searches completed, data on costs are presented according to different levels of demand ranging from zero searches per month to over 100. For example, a search service conducting an average of 40 searches per month, each requiring 20 minutes (.33 hours) of computer connect-time and yielding bibliographies with an average of 75 citations each would incur costs of $2,984 per month. If clients were charged $30 per search, as is currently the case, $1,200 in revenue would be generated, thereby leaving a monthly deficit of $1,784. The actual cost of each search would be $74.59, with $58.27 due to fixed costs and $16.33 due to variable costs. A fee of $30 per search would more than cover the variable cost, but would still leave a deficit of $44.29 per search.

C0111

TABLE 48 -- FIXED COSTS PER MONTH FOR OPERATING SEARCH SERVICE

Budget Item	Number of Search Analysts	
	One	Two
Telephone and Telegraph		
Outside line ($300 per year)	$ 25.00	$ 25.00
Supplies and Printing		
Brochures and business forms ($2,000 per year)	166.67	166.67
Mailing costs for brochures	30.00	30.00
Staff		
Librarian II ($14,850 @ full year including fringe benefits)	1,237.50	2,475.00
Library Assistant II (half-time @ $8,250 per year including fringe benefits)	343.75	343.75
Capital		
Computer terminal ($740 per year)	61.67	61.67
Overhead		
25% of above items	466.15	775.52
Total per Month	2,330.74	3,877.61
Total per Year	27,968.88	46,531.35

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TABLE 49 -- MODEL COSTS AND REVENUE PER MONTH FOR BIBLIOGRAPHIC SEARCH SERVICE

Budget Item		Number of Searches						
		0	20	40	60	80	100	120
Fixed Costs	--	$2,330.74	$2,330.74	$2,330.74	$2,330.74	$2,330.74	$2,330.74	$2,330.75
Variable Costs								
Telephone & Telegraph								
- Lockheed (Cost of ERIC computer connect-time on $200 minimum monthly contract)	.25 hr/s	0	200.00	200.00	280.00	360.00	425.00	490.00
	.33 hr/s	0	200.00	232.00	356.80	443.20	529.00	614.80
	.50 hr/s	0	200.00	360.00	490.00	620.00	730.00	840.00
- TELENET ($5 per hour)	.25 hr/s	0	25.00	50.00	75.00	100.00	125.00	150.00
	.33 hr/s	0	33.00	66.00	99.00	132.00	165.00	198.00
	.50 hr/s	0	50.00	100.00	150.00	200.00	250.00	300.00
- Monthly Telephone (Long distance for contacting clients @$1.00 per search)	--	0	20.00	40.00	60.00	80.00	100.00	120.00
Supplies & Printing								
- Terminal paper ($7.50 per roll; 20 searches per role)	--	0	7.50	15.00	22.50	30.00	37.50	45.00
- Off-line printing of citations at $.10 ea.)	50 cit	0	100.00	200.00	300.00	400.00	500.00	600.00
	75 cit	0	150.00	300.00	450.00	600.00	750.00	900.00
	100 cit	0	200.00	400.00	600.00	800.00	1,000.00	1,200.00

TABLE 49 (Cont'd.)

Budget Item		Number of Searches						
		0	20	40	60	80	100	120
Total Cost per Month	.25 hr/s	$2,330.74	$2,683.24	$2,851.74	$3,068.24	$3,300.74	$3,418.24	$3,735.74
	.33 hr/s	2,330.74	2,741.24	2,983.74	3,319.04	3,615.94	3,812.24	4,208.54
	.50 hr/s	2,330.74	2,808.24	3,245.74	3,653.24	4,060.74	4,348.24	4,835.74
Revenue per Month at $30 per search	--	0	600.00	1,200.00	1,800.00	2,400.00	3,000.00	3,600.00
Monthly Profit (Loss)	.25 hr/s	(2,330.74)	(2,083.24)	(1,651.74)	(1,268.24)	(900.74)	(418.24)	(135.74)
	.33 hr/s	(2,330.74)	(2,141.24)	(1,783.74)	(1,519.04)	(1,215.94)	(812.24)	(608.54)
	.50 hr/s	(2,330.74)	(2,208.24)	(2,045.74)	(1,853.24)	(1,660.74)	(1,348.24)	(1,235.74)
Cost per Search								
Fixed Costs	--	0	116.54	58.27	38.85	29.13	23.31	19.42
Variable Costs	.25 hr/s	0	17.62	13.02	12.29	12.13	10.87	11.71
	.33 hr/s	0	20.52	16.33	16.47	16.07	14.81	15.65
	.50 hr/s	0	23.87	22.88	22.04	21.63	20.17	20.88
Total Cost per Search	.25 hr/s	0	134.16	71.29	51.14	41.26	34.18	31.13
	.33 hr/s	0	137.06	74.59	55.32	45.20	38.12	35.07
	.50 hr/s	0	140.41	81.14	60.89	50.76	43.48	40.30
Cost per Year								
Fixed Costs	--	27,968.88	27,968.88	27,968.88	27,968.88	27,968.88	27,968.88	27,968.88
Variable Costs	.25 hr/s	0	4,230.00	6,252.00	8,850.00	11,640.00	13,050.00	16,860.00
	.33 hr/s	0	4,926.00	7,836.00	11,859.60	15,422.40	17,778.00	22,533.60
	.50 hr/s	0	5,730.00	10,980.00	15,870.00	20,728.88	24,210.00	30,060.00
Total Cost per Year	.25 hr/s	27,968.88	32,198.88	34,220.88	36,818.88	39,608.88	41,018.88	44,828.88
	.33 hr/s	27,968.88	32,894.88	35,804.88	39,828.48	43,391.28	45,746.88	50,502.48
	.50 hr/s	27,968.88	33,698.88	38,948.88	43,838.88	48,728.88	42,178.88	58,028.88

The data recorded in Table 49 are presented graphically in Figure 5. The search service whose inputs are described above is indicated with a black dot. While none of the services described in Table 49 break even regardless of the level of demand, the graph indicates that a service using only 15 minutes of connect-time per search and providing bibliographies with 50 items each would break even if it charged $30 per search and conducted a trace over 120 searches per month. The three dotted lines in Figure 5 represent the three different models tabulated in Table 49. Comparison of the three indicate that at lower levels of demand, the number of searches conducted has a greater impact upon the cost per search than does the amount of computer connect-time used or number of citations printed. At higher levels of demand, the latter two factors become more important. This finding implies that a search service wishing to minimize its cost per search should first concentrate on increasing demand, and later concern itself with reducing variable costs.

The three sample search services detailed in Table 49 and Figure 5 are, of course, just three possibilities out of an infinite number of alternatives. One need only change the average length of computer connect-time and the average length of bibliographies in order to determine alternative costing models.

The lines graphed in Figure 5 representing the various costing models are not straight lines. They change slopes slightly due to the impact of the discount schedule that LIS uses for determining charges. In general, rates descend as the cumulative data-base connect-time used per month increases. This decline in price as usage rises is particularly pronounced if a contract for a guaranteed minimum amount of connect-time is in force, as is the case in these examples which assume that a $200 minimum monthly payment has been guaranteed. This guarantee corresponds to the agreement that EISO has signed.

While the cost of computer connect-time decreases as usage increases, the cost of citations remains constant. Hence, as the cumulative time used increases, the length of bibliographies becomes more important than the amount of connect-time in determining the cost per search. This fact implies that services with large numbers of clients should spend more time on-line in order to develop refined search strategies that yield shorter and more selective bibliographies, rather than accept lengthy bibliographies with few relevant citations such as those that often result from the use of an inadequate search strategy.

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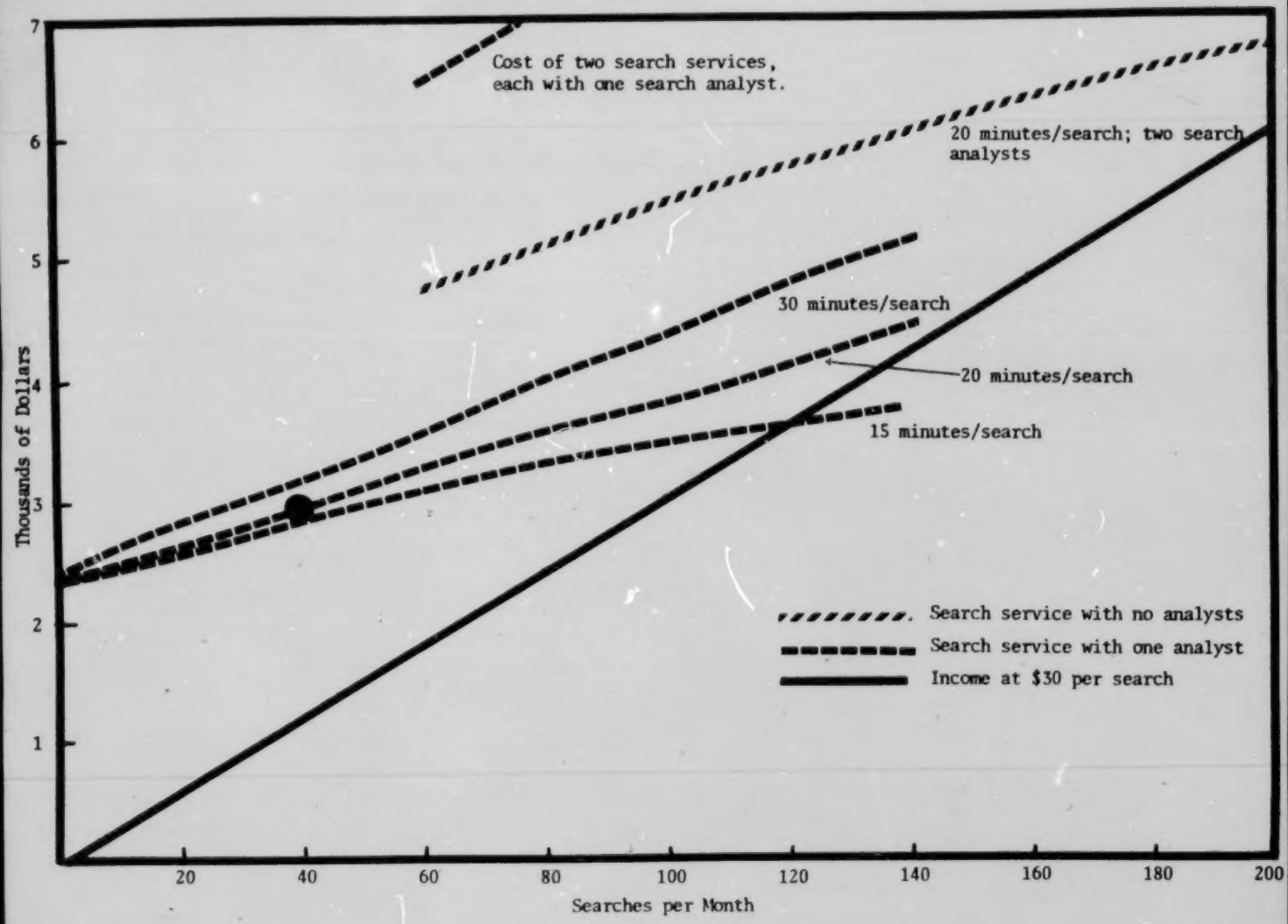
FIGURE 5 -- MODELS FOR COST PER MONTH FOR DIFFERENT SEARCH SERVICES



Provision of a second search analyst to a search service (Table 50) increases the size of the deficit incurred, as can be seen by comparing the line showing the monthly cost of a service with one search analyst with that showing the cost for a service with two search analysts, assuming in each case that a typical search requires 20 minutes of connect-time and produces a bibliography of 75 items (Figure 5). Of course, for operations with many requests there may be no option but to add a second search analyst. At the same time, it should be noted that adding a search analyst to an existing service is far more economical than creating a second search service, a choice which would mean the doubling not only of the salary of a search analyst, but of other fixed costs as well. The cost of operating two search services is so great that only a small portion of the graph for its line can be displayed in Figure 5. Monthly deficits for search services with one and two analysts are $1,519 and $3,066 respectively, assuming that 60 searches are completed per month with each requiring 20 minutes of connect-time and producing a bibliography with 75 citations. The monthly deficit for two separate search services with a combined volume of 60 searches per month would be $4,838. Clearly, it is more economical to increase the size of an existing search service than to create a new one.

In summary, the major factor in determining the cost per search for a bibliographic search service is the level of demand. When the number of requests is less than 60 per month, the fixed costs dominate the cost equation, and the greatest reduction in the average cost per search can be accomplished by increasing the volume of searches. At high levels of demand, the length of time spent on-line and the length of bibliographies become the most important factors. Additional search analysts increase the cost per search substantially, but if additional staff are needed, it is far more economical to add them to an existing service than to create an altogether new service.

Level of Demand

The volume of search requests that a bibliographic search service receives has been identified as a major factor in determining the average cost per search. It is therefore important to know both the overall demand that the Educational Information System for Ontario can expect, and the volume of requests that one search analyst can handle.

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TABLE 50 -- MODEL COSTS AND REVENUE PER MONTH FOR SEARCH SERVICE WITH TWO SEARCH ANALYSTS

Budget Item	Number of Searches						
	60	80	100	120	140	160	180
Fixed Costs	$3,877.61	$3,877.61	$3,877.61	$3,877.61	$3,877.61	$3,877.61	$3,877.61
Variable Costs							
Telephone & Telegraph							
- Lockheed (Cost of ERIC computer connect-time at .33 hour per search)	356.80	443.20	529.00	614.80	688.70	760.80	833.40
- TELENET ($5 per hour)	99.00	132.00	165.00	198.00	231.00	264.00	297.00
- Monthly Telephone (Long distance for contacting clients @ $1.00 per search)	60.00	80.00	100.00	120.00	140.00	160.00	180.00
Supplies and Printing							
- Terminal paper ($7.50 per roll; 20 searches per roll)	22.50	30.00	37.50	45.00	52.50	60.00	67.50
- Off-line printing of citations (at $.10 ea., 75 citations per search)	450.00	600.00	750.00	900.00	1,050.00	1,200.00	1,350.00

TABLE 50 (Cont'd.)

Budget Item	Number of Searches						
	60	80	100	120	140	160	180
Total Cost per Month	$4,865.91	$5,162.81	$5,459.11	$5,755.41	$6,039.31	$6,322.41	$6,605.51
Revenue per Month at $30 per Search	1,800.00	2,400.00	3,000.00	3,600.00	4,200.00	4,800.00	5,400.00
Monthly Profit (Loss)	(3,065.91)	(2,762.81)	(2,459.11)	(2,155.41)	(1,839.31)	(1,522.41)	(1,205.51)
Cost per Search							
Fixed Costs	64.63	48.47	38.78	32.31	27.70	24.24	21.54
Variable Costs	16.47	16.07	15.81	15.65	15.44	15.28	15.16
Total Cost per Search	81.10	64.54	54.59	47.96	43.14	39.52	36.70
Cost per Year							
Fixed Costs	46,531.32	46,531.32	46,531.32	46,531.32	46,531.32	46,531.32	46,531.32
Variable Costs	11,859.60	15,422.40	18,978.00	22,533.60	25,940.40	29,337.60	32,734.80
Total Cost per Year	58,390.92	61,953.72	65,509.32	69,064.62	72,471.72	75,868.92	79,266.12

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The potential demand that EISO can expect remains uncertain. If all boards and faculties of education used the service as heavily as do some, the potential is very great indeed. However a majority of Ontario school boards and faculties of education have yet to try the service. Given the degree of uncertainty that results from having a large number of potential clients but relatively few regular clients, we are unable to project a maximum level of usage that could occur. Nevertheless, we are confident that the potential level is at least twice that experienced to date, a conclusion that we shall explain later.

One factor influencing the level of demand is the price charged for searches. The relationship between price and demand is illustrated by the higher levels of usage that have been observed whenever searches were free. For example, far more requests have been received from the Northeastern Region of Ontario where free searches were distributed to all educational agencies than one would expect on the basis of population alone. In fact, few of the searches from that Region have required payment. Another example of the stimulus provided by free searches occurred in 1973, when OISE participated in a five-week demonstration of on-line retrieval of bibliographies. All searches were free, and in just five weeks 186 search requests were received. This number far exceeds the volume of requests that EISO has received for any period of comparable length.

Data collected during EISO's two years show that the number of requests averaged 52 per month during the first year and 36 per month during the second. The average number of paid searches were 37 per month and 31 per month respectively. Given the different definitions used for the meaning of a search in the two years, the figures for paid searches are probably comparable, while the overall figures suggest some decline in the second year, as would be expected given the smaller number of free searches that were made available. Judging from reports provided by comparable search services, the volume of requests that EISO has received is not atypical. Wanger, *et al.* (1976) report that a survey of 145 educational search services revealed that 45% conduct between 1 and 49 searches a month, 16% between 50 and 99, and 34% over 100. The median value was 58 per month, a value equal to the demand during EISO's peak months. A survey of 125 search services with one search analyst, but not restricted to educational institutions, revealed that 52% conduct between 1 and 19 searches per month, 30% between 20 and 55 searches, and 14% more

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than 55 searches per month. The median number of searches per month for these services was just 18. Taken together, these data suggest that EISO's volume of searches is within the ordinary range for search services with one analyst, and that, as an educational information service, its volume could be expected to increase to an average of 60 search requests per month. It also appears that a full-time search analyst should be able to cope with this load.

Average usage figures do not, of course, reflect actual usage on a month to month basis. Data reported in Table 47 show that demand in peak months is almost double that in slack months. Hence, carrying an average of 60 searches per month would require the completion of as many as 80 searches in a peak month in order to balance a demand for only 40 searches per month in slower periods.

In summary, a target of an average of 60 searches per month appears to be a realistic goal for EISO. As Figure 5 and Table 49 indicate, this level of activity would require that the service continue to be subsidized at a rate of between $1,268 and $1,853 per month -- or between $21 and $31 per search -- assuming that the present practice of charging $30 per search is maintained.

Pricing Policy

EISO's policy on pricing has been to levy a uniform charge of $30 for each search. Exceptions to this policy have been made to assess the effects of different price structures on demand. As noted earlier, agencies in the Northeastern Region of the province were provided with both free searches and, when the free searches were exhausted, a reduced rate of $20 per search. Two additional short-term experiments were also carried out. The first was during the 1976 graduate summer session at OISE when students were charged only $15 per search. The second occurred in 1976, when members of Phi Delta Kappa were given the opportunity to pay only variable costs due to computer connect-time and number of citations printed off-line, which are generally less than the flat $30 rate.

These pricing structures can be evaluated in terms of both their effect on demand and on user opinion. Demand is clearly related to price, if we include free searches as one option. However, the jump from no charge, to charges in the $15 to $30 range seems to have a considerable deterrent effect upon the level of demand. And, judging from the few

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Phi Delta Kappa members who took up the offer to be charged only the variable rate, charging only for computer time and off-line printouts is an equal deterrent. We have not tried charges in the $1 to $14 range, but suspect that token charges in the realm of $1 to $4 would have little effect in deterring clients. This judgement is based on the experience of the Université de Sherbrooke, which reported a tremendous increase in the volume of requests when the price of searches was reduced to just $3 each. Further, we suspect that the deterrent effect of price increases sharply in the $5 to $15 range.

When EISO's users were asked how they felt about the $30 fee, 36% reported that they found it very reasonable, 49% acceptable, and 14% excessive. This response suggests that $30 may be near the upper limit of what most users are willing to pay for the service. Some users have been willing to pay more than $30, however, for exceptionally long and complex searches which require over $50 in computer time and printouts. In a few cases, a surcharge of as much as $100 has been imposed.

Client's opinions about the acceptability of the price for an EISO search vary according to their roles. Using a three point scale (1 = very reasonable, 2 = acceptable, and 3 = excessive), the average responses for clients occupying different roles were as follows: field development, 1.2; administration, 1.6; teaching, 1.7; research, 1.7; library, 1.8; master's student, 2.0; and doctoral student, 2.1. It appears that administrators might be willing to pay more for the service, but that graduate students would not.

EISO's policy of charging a flat rate places it with a minority of search services. Wanger, *et al.* (1976) report that only 27% of all services charge a fixed fee, while 74% impose a variable fee and 4% provide the service on a subscription basis. Of those charging, 81% charged for computer connect-time and off-line printouts, 68% for communication costs, 36% for staff time at the terminal, 32% for the cost of the terminal, 31% for staff time (pre-terminal), 24% for staff time (post-terminal), and only 16% for overhead.

What should EISO's pricing policy be in the future? Should it continue to charge a flat fee, or should the fee be related in some way to the resources required for each search? There are essentially six different policy options:

1. charge for variable costs attributable to computer connect-time, communications and off-line printing;

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2. charge a flat fee to cover part of the fixed and/or variable costs;
3. charge a flat fee to cover part of the fixed costs, plus all of the variable costs listed in (1) above;
4. charge a variable fee to cover part of the fixed costs, plus all of the variable costs listed in (1) above;
5. charge a flat fee to cover all of the fixed costs on the average, plus the variable costs listed in (1) above; and
6. charge a variable fee to cover all of the fixed costs, plus all of the variable costs listed in (1) above.

EISO's current policy is option (2) above, while the policy of most Canadian search services surveyed in Chapter 6 is option (1) for their internal clients and option (3) for their external clients (see Table 56).

It is our feeling that a single pricing policy is probably too restrictive for EISO. It may well be that for some clients, the service should be free, whereas for others, the full cost should be paid. Nevertheless, if we were to recommend one option, it would probably be the fourth one: to charge a variable fee to cover part of the fixed costs, plus the variable costs related to computer connect-time and off-line printouts. We believe the variable fee that covers part of the fixed costs should be related to the length of time spent on the search interview, planning the search strategy, conducting the search, and follow-up activities. This practice would bring some economic discipline to the allocation of time on the part of the search analyst and client. Currently, a search requiring two hours of work is no more expensive than one taking only twenty minutes. Under such a system there is no motivation for spending time wisely and, since any negotiation session could go on indefinitely, there may be a tendency to continue interview sessions beyond the point that is necessary. If staff time were charged for in half-hour blocks, this would be less likely to happen, and all concerned would be more likely to end a session when no new insights were being developed. On the other hand, we would not advocate charging by a shorter time period, since such a policy might place too much emphasis on efficiency and not enough on quality.

If a policy to charge a fee for each half-hour of staff time is adopted, what should that charge be? Logically, it should be some portion of the average fixed cost. For example, if the search service conducted 60 searches per month, each requiring an average of 20 minutes of computer connect-time and producing a bibliography with an average of 75 citations,

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then the average fee should be less than $38.85, which is the average fixed cost (Table 49). Assuming the average search took about one hour for both interviewing and searching, as was the case in EISO's second year, and that the objective was to recover approximately one-third of the fixed costs, then a rate of $12 per hour or $6 per half-hour seems reasonable. Thus, a typical search might cost $12 in staff time and $16.47 in variable charges (Table 49) for a total of $28.47. On the other hand, a search taking two hours of staff time, 30 minutes of connect-time, and producing a bibliography of 100 items would cost the client $24 in staff time and $22.04 in variable charges, for a total of $46.04.

It is, of course, not necessary to charge all types of users the same amount for staff time. If it was felt that some group could or should pay more, then the rate could be higher for that group. In essence, this is what most search services do when they charge external users a higher fee than they charge internal users. On the other hand, if there was a desire to make the service more accessible to some category of users, then the rate might be reduced to, say, $6 per hour for members of that group.

As noted above, charging users $12 per hour for staff time would, on the average, cover only one-third of the fixed costs. This would still leave a projected monthly deficit of between $800 and $1,200 for a service conducting an average of 60 searches per month. What organization or organizations should cover this deficit? Most search services in the United States receive federal assistance, an option which is not available in Canada. There is, in fact, no single answer to this question. Several possible options to be considered are discussed later in Chapter 7.

Microfiche and Article Duplication Service

The microfiche and article duplication service is an integral part of the Educational Information System for Ontario. Without it, the bibliographies that EISO provides would be of little value to the clients since they would find it difficult to obtain original materials. Initially, the prices charged for copies were set very low in order to encourage users to purchase them. The price for diazo copies of microfiches was set at $.35 each and that for photocopies of journal articles at $.10 per page. In the sections that follow, we take a closer look at the duplication service and its prices in order to determine what future policies might be.

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TABLE 51 -- CUMULATIVE MONTHLY REPORT FOR EISO DUPLICATION SERVICE

Month	Number of Orders[1]	Number of Documents or Articles			Copies Supplied[2]	Total Charge	Average Charge
		Ordered	Supplied				
			No.	%			
June 1976	8	80	78	98	366	$ 7.35	$ .92
July	14	90	81	90	188	40.05	2.86
August	13	103	93	90	254	53.65	4.13
September	14	100	93	93	733	186.55	13.33
October	16	118	104	88	308	49.30	3.08
November	25	192	172	90	413	83.55	3.34
December	6	92	82	90	219	44.15	7.36
January 1977	22	326	273	84	782	146.95	6.68
February	9	116	106	91	330	60.75	6.75
Monthly Average[3]	14	135	120	90	399	74.70	5.38

[1]A request both for ERIC documents and journal articles is considered two orders, one for documents and one for articles.

[2]Copies: copies of microfiche for documents, pages for articles.

[3]Column averages.

As with the search service, the duplication service's unit costs are determined largely by the volume of requests. Table 51 displays the number of orders that were received for copies of either documents or articles during the period from June 1976 through February 1977. On the average, 14 orders were received per month, counting orders for microfiches and articles separately. The average order contained a request for 10 items, of which 9 were supplied for an average charge of $5.38. A total of 399 copies were made in a typical month and the charges totalled about $75. In comparison to the search service, the duplication service is a rather modest enterprise.

To determine the actual cost of the duplication service, an analysis of fixed and variable costs was undertaken. Because duplication of microfiches requires special equipment, the costs for providing this service are costed separately from those for duplication of articles. The latter service requires only a standard office copier, the cost of which is accounted for in the overhead.

Table 52 reports the fixed costs per month for operating the duplication services. The total for duplicating microfiches is $349 per month,

TABLE 52 -- FIXED COSTS PER MONTH FOR OPERATING MICROFICHE AND ARTICLE DUPLICATION SERVICES

Budget Item	Microfiche	Articles	Total
Supplies and Printing			
Business Forms	$ 16.67	$ 16.67	$ 33.34
Staff			
Library Assistant II (quarter-time on each service at $8,250 per year including fringe benefits)	171.88	171.88	343.76
Capital			
Microfiche Printer/Processor ($1,088 per year for 5 years)	90.67	--	90.67
Overhead			
25% of above items	69.80	47.14	116.94
Total Fixed Cost per Month	349.02	235.69	584.71
Total Fixed Cost per Year	4,188.25	2,828.25	7,016.50

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while that for duplicating articles is $236. The difference in costs is accounted for by the inclusion of the monthly cost of the microfiche printer/processor in the total for the microfiche duplicating service.

The effect of the volume of requests upon the unit cost for duplicating microfiches can be seen in Table 53. The cost per copy for a volume of 100 fiches per month is $3.59, but this drops to $.60 when the volume reaches 700 per month. At the current rate of $.35 per fiche copy, a subsidy would be required until almost 1,400 copies were made per month. While such a level of operation is theoretically possible with the staff and equipment allocated for the purpose, we would estimate that in practice the burden of correspondence associated with each request reduces the maximum number of fiches that can be copied in one month to about 700.

Parallel data for a service providing copies of articles is presented in Table 54. Again, fixed costs dominate the equation, and even at the level of 700 copies per month, the cost per page is $.34. To break even while charging $.10 per copy would require a volume of almost 4,000 copies per month.

The labour involved in copying journal articles is considerable, exceeding that for copying microfiches since it requires that volumes of journals be collected from over a wide area, that they be transported on carts to the copying room, and that they be reshelved after copying. In contrast, master copies of ERIC microfiches are all stored in one place, and are very easy to transport and file. Hence, while a volume of 700 or even 4,000 paper copies per month may not appear very substantial in terms of the numbers of pages duplicated, it does represent a tremendous amount of work in handling the journals themselves.

How do the hypothetical figures in Tables 53 and 54 compare with EISO's actual experience? This question can be answered by comparing these two tables with Table 55. On the average, EISO duplicated 169 microfiches and 230 pages of journal articles per month. Given these numbers, the average costs were $2.17 per microfiche and $1.06 per page. However, in a peak month like January 1977, these average costs dropped to $1.33 each for microfiches and $.46 per page for journal articles.

EISO's duplication service, like its search service, has not yet met its potential. For the search service, we indicated that a reasonable goal was to conduct an average of 60 searches per month, which is about twice the current number. If this goal were achieved, it is reasonable to assume that the average volume of requests for duplicates would also

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TABLE 53 -- MODEL COST AND REVENUE FOR MICROFICHE DUPLICATING SERVICE

Budget Item	Number of Microfiche Duplicated per Month							
	0	100	200	300	400	500	600	700
Fixed Costs	$ 349.02	$ 349.02	$ 349.02	$ 349.02	$ 349.02	$ 349.02	$ 349.02	$ 349.02
Variable Costs								
Microfiche copies ($.10 ea.)	0	10.00	20.00	30.00	40.00	50.00	60.00	70.00
Cost per Month	349.02	359.02	369.02	379.02	389.02	399.02	409.02	419.02
Revenue per Month at $.35 per fiche	0	35.00	70.00	105.00	140.00	175.00	210.00	245.00
Profit (Loss) per Month	(349.02)	(324.02)	(299.02)	(274.02)	(249.02)	(224.02)	(199.02)	(174.02)
Cost per Fiche								
Fixed Cost	0	3.49	1.75	1.16	.87	.70	.58	.50
Variable Cost	0	.10	.10	.10	.10	.10	.10	.10
Total Cost per Fiche	0	3.59	1.85	1.26	.97	.80	.68	.60
Cost per Year								
Fixed Cost	4,188.25	4,188.25	4,188.25	4,188.25	4,188.25	4,188.25	4,188.25	4,188.25
Variable Cost	0	120.00	240.00	360.00	480.00	600.00	720.00	840.00
Total Cost per Year	4,188.25	4,308.25	4,428.25	4,548.25	4,668.25	4,788.25	4,908.25	5,028.25

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TABLE 54 -- MODEL COST AND REVENUE FOR ARTICLE PHOTOCOPY SERVICE

Budget Item	Number of Pages Copied per Month							
	0	100	200	300	400	500	600	700
Fixed Costs	$ 235.69	$ 235.69	$ 235.69	$ 235.69	$ 235.69	$ 235.69	$ 235.69	$ 235.69
Variable Costs								
Paper copies ($.04 ea.)	0	4.00	8.00	12.00	16.00	20.00	24.00	28.00
Cost per Month	235.69	239.69	243.69	247.69	251.69	255.69	259.69	263.69
Revenue per Month at $.10 per page	0	10.00	20.00	30.00	40.00	50.00	60.00	70.00
Profit (Loss) per Month	(235.69)	(229.69)	(223.69)	(217.69)	(211.69)	(205.69)	(199.69)	(193.69)
Cost per Page								
Fixed Cost	0	2.36	1.18	.79	.59	.47	.39	.34
Variable Cost	0	.04	.04	.04	.04	.04	.04	.04
Total Cost per Page	0	2.40	1.22	.83	.63	.51	.43	.38
Cost per Year								
Fixed Cost	2,828.28	2,828.28	2,828.28	2,828.28	2,828.28	2,828.28	2,828.28	2,828.28
Variable Cost	0	48.00	96.00	144.00	192.00	240.00	288.00	336.00
Total Cost per Year	2,828.28	2,876.28	2,924.28	2,972.28	3,020.28	3,068.28	3,116.28	2,164.28

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TABLE 55 -- VOLUME AND REVENUE FOR DUPLICATION SERVICE

Month and Year	Type of Duplication			
	Microfiche		Articles	
	Number of Fiche	Revenue	Number of Fiche	Revenue
June 1976	89	$ 5.95	277	$ 1.40
July	85	29.75	103	10.30
August	113	39.55	141	14.10
September	411	154.35	322	32.20
October	74	25.90	234	23.40
November	169	59.15	244	24.40
December	89	31.15	130	13.00
January 1977	275	96.25	507	50.70
February	219	38.85	111	21.90
Total	1,524	$480.90	2,096	$191.40
Average	169	$ 53.43[†]	230	$ 21.27[§]

[†]Includes some duplicates for which no charge was made. Theoretical monthly revenue at $.35 per fiche would be $59.15.

[§]Includes some duplicates for which no charge was made. Theoretical monthly revenue at $.10 per page would be $23.00.

double. At that level of demand, with 350 microfiches and 500 pages duplicated per month, the average cost per fiche would be $1.08 and the average cost per page would be $.47.

In summary, current prices for EISO's duplication service are approximately one-quarter the actual cost for microfiche and one-tenth actual cost for paper copies of journal articles. Even achieving the goal of doubling the current level of demand would only reduce these ratios to one-third and one-fifth actual costs, respectively. It is our belief that the prices of both types of copies should cover a greater proportion of the actual costs.

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There are many different schemes that one might use to charge for copies of microfiche and journal articles. Four options in common use are:

1. to charge more than EISO's current amounts for each microfiche and page that is copied;
2. to add a flat charge onto the price of each search, which automatically entitles the client to copies of several microfiches and journal articles;
3. to charge a flat fee for a minimum order up to a given size, with additional material being charged for on a per-copy basis; and
4. to charge a fixed amount for each microfiche and each article up to a given length, with incremental charges imposed thereafter.

If the first option were taken, the price of a microfiche might be raised to $.65, which is the price being charged for ONTERIS microfiches. At this rate, revenue would cover 60% of the actual costs for a service duplicating 350 microfiches per month. Paralleling this, the per-page charge for photocopies might be raised to $.25 per page, a rate which would cover slightly more than 50% of the actual costs, assuming a volume of 500 pages per month.

The second option of including the cost of duplication in with the cost of the search is one used by many search services whose clients are geographically dispersed. They set the price of the search high enough to cover the cost of duplicating several microfiches and articles. Usually, the search analyst will review the bibliography and select the items to be copied, and these are forwarded to the client along with the bibliography. This approach speeds the flow of information and reduces the paper work substantially. If this option were adopted, a reasonable fee might be $5.00, given that the average order received during 1976 cost the user $5.38. For $5.00, the client might receive up to 5 fiches and 20 pages. An order of this size, at current rates, would cost $3.75. While this mode of charging for materials might be welcomed by clients outside of Metropolitan Toronto, local users might wish to be exempted from it since many prefer to locate materials on their own, either in their own boards or at OISE.

The third option is similar to the second, except that the basic fee is optional and would be somewhat lower, perhaps $2.00. For this amount, the user might receive up to 2 microfiches or 15 pages or some combination of the two. This policy would eliminate very small orders

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which are hardly large enough to justify the cost of collecting and depositing the money.

The fourth option, which might be applied only to journal articles, would set a minimum fee of perhaps $2.00 for each item, no matter how short. Typically, the fee would pay for duplication up to a limit of, say, 3 fiches or 20 pages. Thereafter, a per-fiche charge of $.35 and a per-page charge of perhaps $.10 would be imposed. For example, an order of three articles of 3, 7, and 26 pages each would cost the user $6.60 -- $2.00 each for the first two, and $2.60 for the third. This approach has the merit of charging a fixed amount for the cost of retrieving, transporting, and re-filing or reshelving the fiche or volume, steps which cost the same regardless of the number of fiche or pages included.

Our own preference for a pricing policy would be to adopt the first option for microfiches, and the fourth option for journal articles. However, additional research is necessary to determine the appropriate level of the fixed charge to be set for journal articles.

Conclusion

Many variables affect the efficiency with which the Educational Information System for Ontario operates. For example, some bibliographic retrieval systems are less expensive than others and some searches require less staff time and result in shorter and less expensive bibliographies than do others. Two years of experience and analysis of considerable quantities of data revealed several critical factors affecting costs that must be considered in the future operation of EISO.

A number of different data bases are regularly searched by EISO. The least expensive of these is ERIC, which, it will be recalled, is also the source of bibliographies which users rated most highly. ERIC is available on two search systems regularly used by EISO, Lockheed's DIALOG and SDC's ORBIT. Though the rates charged for DIALOG are less than those for ORBIT, the savings of time experienced in using the faster SDC system equalized the two systems' costs for the typical search. It appears, then, that there is no economic advantage that accrues to either system, though advantages do exist in searching ERIC rather than other data bases.

Comparison of the volume of searches conducted in each of EISO's two years showed that the average number of searches conducted per month had declined from 52 to 36 while the average cost per search had increased

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from $15 to $25. The latter increase corresponded to an average increase in computer connect-time per search from 12 minutes (on ORBIT) to 25 minutes (on DIALOG) and an increase in the average number of citations included in a bibliography from 46 to 88. The decline in volume was partly attributable to the reduction in the number of free searches offered to potential clients, while the increase in the connect-time and length of bibliographies were attributable to differences in the systems used and in the search analysts. Corresponding to the decline in the number of free searches has been an increase in the number of searches paid for by clients from 70% in the first year to 86% in the second.

EISO's costs were analyzed by dividing them into fixed and variable costs, and into several budget categories: telecommunications, staff, materials and supplies, capital, and overhead. Separate estimates were made for the costs of the search service and the duplication service, with the latter being broken down according to the duplication of microfiches and the duplication of journal articles.

Three costing models were developed in order to analyze the impact of the amount of computer connect-time used per search, the number of citations printed per bibliography, and the number of searches completed per month, upon the average cost of a search and the total cost of the service. In these models, it was assumed that 15, 20, or 30 minutes of connect-time were used per search and that bibliographies included 50, 75, or 100 references respectively. At a volume of 60 searches per month, the average costs of searches would range from $51 to $61. If $30 were charged per search, the deficit per search would range from $21 to $31, and the total deficit for a typical month from $1,218 to $1,853.

The impact of adding a second search analyst to an existing service increases the deficit considerably. However, it is still a far more economical alternative than creating an altogether new search service, should demand become too great for one search analyst to handle.

Users were relatively satisfied with EISO's current practice of charging $30. However, this system of pricing brings no economic discipline to the allocation of resources, such as computer connect-time, staff-time, and number of citations printed. Therefore, other pricing methods should be considered. While there are at least six different options for charging, the most attractive to us is to charge separately for the search analyst's time, computer time, and citations printed.

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The duplication services are costed in a manner similar to the search service. Current cost per microfiche duplicated is estimated to be $2.17, while cost per journal page duplicated is $1.06. Doubling the volume of searches to 60 per month would also double the volume of requests for duplicates, thereby reducing unit costs for duplication to $1.08 per fiche and $.47 per page. These costs still exceed the current rates of $.35 and $.10 respectively. Therefore, after considering four options, it is recommended that the price of duplicate fiche be raised to $.65, and that a fixed charge, such as $2.00, be imposed for each journal article duplicated up to a given length with a charge per page assessed for additional pages.

The volume of demand for both searches and duplicates is the main factor determining EISO's unit costs. The system should set a goal of conducting at least 60 searches per month on the average. This implies that as many as 80 searches might be conducted in a busy month to offset the lower volumes at other times. Unfortunately, demand is tuned to the cycles of the academic year, and therefore wide variations in demand must be accommodated. EISO's two years of experience, plus that of others, suggests the goal of 60 searches per month is possible. The inverse relationship between demand and user satisfaction noted in Chapter 3 suggests this goal must be approached with caution in order to ensure that the quality of EISO's work does not suffer.

This chapter shows that operating even a modest on-line bibliographic retrieval service is quite expensive, costing a minimum of $30,000 per year. This is a considerable cost, but it is technologically imperative that information services in all fields, including education, adopt on-line searching. Indeed, this technology is being adopted as a regular feature of many libraries, as the survey of Canadian on-line services in the next chapter reveals.

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CHAPTER 6

ERIC Data Base Search Services in Canada

Educational Resources Information Center (ERIC) indexes and microfiches have earned a position as major sources of information for educational researchers and practitioners in Canada. Their widespread use has been facilitated by the development of computerized search services, first using batch systems and more recently on-line interactive retrieval methods. While it is too soon to assess the long-term implications of the greatly increased accessibility of ERIC, it may be that Canadian educators will become hooked on ERIC and neglect Canadian sources of information if automated access to these remains unavailable (Auster and Lawton, 1974).

Use of ERIC

ERIC is available throughout Canada. Its indexes to educational journals (*Current Index to Journals in Education* or CIJE) and to fugitive documents (*Resources in Education* or RIE) are found in most libraries in faculties of education, teachers' colleges, ministries of education, and larger school boards. Collections of the microfiche copies of documents indexed and abstracted in RIE are held by 38 agencies, including at least one in each province (National Institute of Education, 1975).

The extent to which ERIC is actually used in Canada is exceedingly difficult to estimate. Few statistics are maintained in education libraries across the country and it is unlikely that detailed information on matters such as the frequency with which printed indexes are used can even be acquired in an economically feasible way. In order to obtain what data were available, a brief telephone survey of major libraries and information centres was undertaken in February, 1977 (see interview questionnaire, Appendix N, and organizations surveyed, Appendix O).

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Three universities, one teachers' college, and one school board reported that they record circulation statistics for ERIC microfiches. The University of Manitoba estimated 8,000 ERIC fiches were used in 1976, and the Ontario Institute for Studies in Education reported 8,400 fiches had been used. Usage at OISE fluctuates during the year with peak usage of over 1,000 fiches per month during the regular and summer sessions, and minimum circulation of about 350 fiches in June. Comparative statistics for the fall term of 1975 and fall term of 1976 at OISE showed an increase in usage of 7.6%. Comparative statistics also were available for McGill University Education Library, which reported an increase in microform usage of 11% from 450 to 500 fiches during the last six months of 1976 compared with the same period in 1975. ERIC fiches comprise approximately 90% of the McGill microform collection. The library at the Nova Scotia Teachers' College reported a "low" level of usage for ERIC fiches, though use is increasing due in part to a greater demand for fiches on interlibrary loan. Finally, the professional library of the Calgary Board of Education stated that only about 40 fiches per month circulated. Teachers were perceived as being unaware as yet of the resource ERIC provides.

Taken together, these data confirm the view that ERIC is an important source of information and that its use is growing. Levels of use appear to be greatest in larger universities, with professionals in the field making the least use. One factor affecting level of use may be the availability of microfiche equipment.

Facilities available for using ERIC microfiches vary considerably, though most institutions have both stationary readers and reader-printers. Of those surveyed, only the University of British Columbia and OISE duplicate fiches and have portable readers available for loan. Several libraries did indicate that fiches could be borrowed through interlibrary loan, as is the case in Nova Scotia where the Nova Scotia Teachers' College maintains the sole collection of ERIC microfiches in the province. In summary, it appears that while ERIC fiches are available across Canada, obtaining them is relatively difficult for those not located in an institution holding the collection. Individuals in this situation may be forced to rely on the ERIC Document Reproduction Service (EDRS) in the U.S., a service with which many reported considerable difficulty. Requests for fiches from EDRS usually entail six to eight week delays and confusion over exact charges. It appears that opening a deposit account with EDRS may well be worth the cost for organizations placing frequent orders.

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Fiche to paper duplication of ERIC documents is a service which is not provided on an open basis by any of the agencies surveyed. A few will print a limited number of pages, for a charge from $.10 to $.25 per page. EDRS remains the most economical source from which to order "hard copy" of ERIC documents. Problems reported in ordering hard copy from EDRS are similar to those reported for ordering fiches.

The time required to conduct manual searches of RIE and CIJE has presented still another obstacle to the use of ERIC. Only graduate students and professional researchers have had the time to devote to the task. Of course, the same difficulty is encountered with other sources of information such as the *Canadian Education Index* (CEI) or *Canadiana*. This situation has been changing drastically, however, with the advent of computerized searching of data bases.

Computerized Searching

Use of computers to search bibliographic data bases began about ten years ago with the development of batch systems which ran "user profiles" against magnetic tapes containing appropriate data bases, such as RIE and CIJE. The tapes themselves were a by-product of computerized processes then being introduced to facilitate the production of printed indexes. Batch searching of data bases quickly became a major tool for larger libraries or computer centres offering "current awareness" services, and they are still used for that purpose at institutions such as the National Library of Canada. However, the technique has two major limitations which have impeded its widespread utilization. First, it is exceedingly difficult to obtain a satisfactory bibliography of relevant items on the first run. If terms used in the search are too broad, there may be too many citations; if they are too narrow, then too few may be located. Usually, several runs are necessary before a profile is adequately refined. The second difficulty with batch searching of bibliographic data tapes is its expense, particularly if requests are few and searching is extended to many data bases covering many years. Today, batch searching is restricted to high volume operations where profiles are already established (e.g., a continuing current awareness service) or where precision of the search need not be too great. Given the decreasing costs of on-line searching, however, it is problematic whether or not on-line and batch systems will continue to coexist. One university (the University of Saskatchewan) reported that

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their in-hous batch system had been discontinued in fall 1976, and that commercial and governmental on-line systems would be used in the future.

On-line interactive searching of bibliographic data bases, which has become highly developed only in the past three years, provides a far more flexible and attractive mode of searching ERIC and other bibliographic data bases. These services allow exceedingly complex search strategies to be executed and refined on-line, with the numbers of citations located at each stage being printed as the terms are entered and combined. Sample citations can be reviewed, their abstracts read, and the search strategy modified if need be. One can search by subject, by author, by year, and by "string" searching of titles, abstracts, or descriptors. If time is of the essence, a complete bibliography can be printed on-line; if not, less expensive and more readable off-line printouts can be obtained.

The diversity of available data bases is another advantage of on-line services available from commercial establishments and government agencies. Few computer centres could afford to maintain the more than 50 data bases available on services provided by Lockheed Information Systems (LIS) and System Development Corporation (SDC). Included are ERIC's RIE and CIJE, *Psychological Abstracts*, *Dissertation Abstracts*, *Exceptional Child Education Abstracts*, and *Sociological Abstracts*. Data bases are up-dated monthly and new data bases are constantly being added. LIS's recently acquired ability to store search strategies and to run these automatically with each up-date makes it possible to offer a current awareness service for each search executed for a client with virtually no extra labour and little extra cost.

On-line interactive search services are being adopted by reference services in university and government libraries across Canada at a very rapid rate, even at institutions which maintain batch search systems. The telephone survey revealed that many universities have added the service recently or are considering the possibility (see Table 56). No doubt others not included in the survey also offer the service or will soon do so.

The volume of computer searches of ERIC and other data bases is somewhat better documented than the use of ERIC materials themselves. Those institutions just beginning to offer on-line interactive searches report three or four requests are received per week. More mature services find that 15 to 20 clients per week may be expected. Depending on the topic and sophistication of the clients, this level of demand may well be

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TABLE 56 -- SURVEY OF ERIC DATA BASE SEARCH SERVICES IN CANADA

Organization	Population Served	Cost Per Search	Search System Used
Alberta Department of Education Alberta Education Library (403) 427-2985	Department of Education	Free	DIALOG [1] ORBIT [2]
Brandon University (204) 728-9520	University faculty and students	Free	University of Manitoba batch system
McGill University Medical Library (514) 392-4339	Open	Cost of connect-time, communications and off-line print charges	DIALOG
Memorial University (709) 753-1226	Open	Connect-time plus off-line print charges	DIALOG ORBIT SDI through National Library
Ontario Institute for Studies in Education (416) 923-6641 x487	Ontario educational community	$30 per search	DIALOG ORBIT
National Library of Canada (613) 992-0474, or 992-5190	Open	1) $72 per year current awareness 2) $20 per search for on-line	1) CAN/SDI batch system 2) DIALOG ORBIT

TABLE 56 (Cont'd.)

Organization	Population Served	Cost Per Search	Search System Used
St. Mary's University, Halifax (902) 422-7361	Open	$20 base fee plus $2 per minute of connect-time, plus 15¢ per printed reference	DIALOG
University of Alberta Education Library (403) 432-3770	1) University community 2) Open	1) $20 up to a limited number of citations 2) $25 up to a limited number of citations	DIALOG ORBIT
University of British Columbia			
1) Social Science Library (604) 228-2725	1) Open	1) Not yet determined	1) DIALOG ORBIT
2) Information/Knowledge Research Centre Faculty of Education (604) 228-6229	2) (a) Faculty and students (b) Open	2) (a) Free (b) $45 plus 5¢ per citation over 100	2) In-house batch system
University of Calgary (403) 284-6221	Open	1) Batch SDI -- $10 per year 2) On-line -- computer connect-time plus communication costs, plus off-line print charges	1) In-house batch system 2) DIALOG

TABLE 56 (Cont'd.)

Organization	Population Served	Cost Per Search	Search System Used
Université Laval (418) 656-2888	Ouvert	Clientèle extérieure, $20; clientèle intérieure, $3 (donne droit à 100 références imprimées)	DIALOG ORBIT
University of Manitoba (204) 474-8725	Ministry of Education, staff and students	Free	In-house batch system
University of New Brunswick (506) 453-4742	Open	See National Library	Through National Library
University of Saskatchewan (306) 343-4293	Open	$2 per minute connect-time plus off-line print charges	DIALOG ORBIT
Université de Sherbrooke (819) 565-5457	Open	$3 (donne droit à 15 minutes et 100 références imprimées)	DIALOG ORBIT
University of Toronto (416) 978-6215	1) University community 2) Open	1) Computer connect-time plus communication costs, plus off-line print charges 2) Above, plus $10	DIALOG ORBIT

TABLE 56 (Cont'd.)

Organization	Population Served	Cost Per Search	Search System Used
York University			
1) Institute for Behavioral Research (416) 667-3026	1) (a) York University Community	1) (a) Free	1) In-house system
	(b) Open	(b) $20 per search for up to 50 references; 5¢ per reference over 50 to maximum of $35 additional charges	
2) Stacey Science Library (416) 667-3927	2) (a) York University Community	2) (a) Connect-time plus communication plus off-line print charges	2) DIALOG ORBIT
	(b) Open	(b) Above plus $30	

[1]DIALOG is the bibliographic retrieval system of Lockheed Information Systems.

[2]ORBIT is the retrieval system of System Development Corporation, which is marketed in Canada by INFOMART.

the maximum one a trained searcher can handle assuming that careful interviewing and planning of search strategies are undertaken.

Batch search services, which tend to be free for internal users, report a higher level of demand. The University of British Columbia reported between 50 and 100 searches are undertaken each week, mostly for staff and students of the faculty of education. Clients of batch search services rarely have the assistance of a trained search analyst in planning their search strategies.

It would appear that different norms are developing among those providing interactive as opposed to batch searching of data bases. Interactive search services tend to operate as part of the reference sections of libraries, especially special libraries, and emphasize the staff's ability to assist in developing good search strategies. Usually, one or more librarians specialize in offering this service, and have distinctive titles such as "search analyst," search editor," or "computer librarian." Batch services, while indicating a preference for this style of operation, in fact tend to place a greater burden on the client except where a current awareness service is being provided for a fee. Also, those providing interactive searching almost invariably charge for the service, whereas most batch systems are free to a selected clientele. However, both tend to charge external users a higher fee than internal users. It would appear that the technology developed for interactive searching is more easily adapted to the library setting and the role perceptions of reference librarians than is batch searching. One result is that reference librarians are no longer providing only free services, as has been the norm in the past. Another is the increased emphasis on the skills of the librarian in "negotiating" reference questions with the client.

Impact of On-Line Searching

How will the availability of on-line searching affect the use of ERIC in Canada? What will its impact be on Canadian libraries? Unfortunately, very little data is available on which a long-term forecast can be based. Our experience in developing the Educational Information System for Ontario, and that of those surveyed for this report, suggest that provision of on-line search services may

1. increase demand for ERIC microfiches,
2. increase demand for journals indexed in CIJE,

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3. increase utilization of interlibrary loan,
4. require specially trained librarians to serve as search analysts,
5. require that charges for computer time, communication costs, and off-line printing be levied,
6. appeal most to graduate students, professors, and officials responsible for research, evaluation, planning, and curriculum development, and
7. foster dependence on ERIC and neglect of printed indexes for other sources.

Any one of these seven points might be expanded in detail. The acquisition of materials located via a computer-produced bibliography is probably the most immediate concern most users will face. Unfortunately, it is much easier for an agency or library to acquire a computer terminal and begin doing searches than to ensure that back-up materials are readily available. While interlibrary loans may be satisfactory for a small number of requests, the high volume of requests that a successful search service may create could impose an undue burden. In creating EISO this problem was largely solved by its integration with the OISE Library which holds an extensive collection of journals and the ERIC microfiche collection. To date, EISO has been able to fill over 99% of all valid requests for copies of fiches, and over 85% of all requests for copies of journal articles.

Trained search analysts able to elicit good descriptions of search topics from clients and to create successful search strategies are also of critical importance. EISO's experience, confirmed by others, indicates that several months' experience of full-time searching is needed to develop an analyst's full capability. Interviewing or "negotiating" skills are of particular importance: an incorrect diagnosis will result in an incorrect selection of terms. Since a typical search requires over one hour for interviewing the client, developing a search strategy and running the search, it is obvious that being a search analyst requires considerable skill. Keying terms into a computer terminal is only a small part of the process.

Charges for bibliographies produced by on-line interactive search systems have been imposed by most agencies offering the service, though a few provide free searches to members of their organization or arrange for direct billing of computer charges to the client's organization or unit. Typically, the charge is either a flat rate in the $20 to $45

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range or a sliding scale based on minutes of computer connect-time and number of citations printed off-line. Most organizations with batch systems provide free searches to internal clients, and use a fee schedule similar to that described for on-line systems for external clients. Fee schedules are listed in Table 56.

Finally, our concern about Canadian educators developing a dependence on ERIC and other American-produced data bases was echoed by several of those contacted in the telephone survey. To date, no Canadian data base in the social sciences has been automated. The first such system developed for educational research materials is the Ontario Educational Research Information System (ONTERIS). It is clear that sole dependence on ERIC for acquiring information in education must be guarded against (Summers, 1974) and that the complete automation of indexes such as *Canadiana* and the *Canadian Education Index* should be encouraged in order to ensure that this dependence does not develop.

Conclusion

New on-line computerized search services are making ERIC and other major data bases more readily accessible throughout Canada. Major subscribers are university libraries and libraries in federal and provincial ministries. Use of ERIC, already substantial, is certain to increase in the future.

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CHAPTER 7

Alternative Organizational Structures for EISO

Who will fund and staff the Educational Information System for Ontario after the Ministry of Education research and development funds terminate at the end of EISO's third year? Will the service remain centralized, or will it become a decentralized network with many nodes? These and other major policy questions must be addressed in the near future if the momentum developed during EISO's three years of operation is not to be dissipated at the end of March, 1978.

Current Organization

To date, EISO has been almost entirely supported by annual research contracts from the Ontario Ministry of Education to the Ontario Institute for Studies in Education. The impermanence of the funding and demands of the research and development phases of the project necessitated a temporary organizational arrangement at OISE to carry out the terms of the contract. Specifically, EISO has been administered by the Department of Educational Administration at OISE under the supervision of the Office of the Coordinator of Research and Development. At the same time, the search service was quartered in the OISE Library so that it would have ready access to journal and microfiche collections which were needed to provide back-up materials for the computer-produced bibliographies generated by the service. Indeed, one major reason the EISO contract was awarded to OISE was OISE's unparalleled collection of educational resource materials.

The temporary nature of the funding was not, however, reflected in the program of research, development, and training that EISO pursued. From the start, it was assumed that a decision eventually would be taken

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to make the service permanent. To have assumed otherwise would have undermined attempts to assess the viability of the service since users are unlikely to come to trust a service which does not have confidence in its own future. Research has focused upon identifying the service's potential clientele; development upon creating a service that is efficient and maintains high standards; and training upon the familiarization of Ontario educators with the service and the provision of Educational Information Consultants to Northern Ontario. The results of these endeavours provide a sound foundation for building a permanent service to meet the information needs of Ontario educators.

The question to be answered, then, is what form a permanent educational information service should take, assuming that funds will be available. In considering this issue, we felt it best to begin by a review of the objectives held for EISO, the clientele it serves, the staff and resources it requires, and the services it provides. These factors to some extent limit the organizational options for the service that can be realistically considered.

Objectives

EISO's major goal is to improve education in Ontario by making it easier for educators to locate and obtain information for use in making decisions about programs, curriculum, personnel, etc. EISO attempts to achieve this goal by providing ready access to resources indexed in the various bibliographic data bases available for computerized searching. In doing so, the assumption is made that relevant research, curriculum, or other materials are available and can be put to use in improving education. Depending on the client in question, the utilization of the materials to improve Ontario education may occur immediately, as in the case of a school administrator, or after a lapse of time, as with a graduate student currently involved in advanced studies.

Clientele

EISO's clientele is strictly limited to Ontario educators, though the latter is broadly defined to include not only professionals in school boards and the Ministry of Education, but also members of faculties of education, Colleges of Applied Arts and Technology, the Ministry of Colleges and Universities, etc. Even so, data presented elsewhere in this report show quite conclusively that EISO has two major constituencies --

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board personnel and academic personnel, the latter including researchers and students. Each of these two groups constitutes approximately 40% of the clientele; users from government ministries, CAAT's, etc. make up the remaining 20%. This classification of users according to the kind of organization at which they are employed is important to bear in mind when considering the future organization and location of EISO.

Staff

Staffing an educational information service has not proven particularly difficult, but this may in large part be due to the depressed state of the job market in which many well-qualified individuals are seeking work. EISO required that both of the search analysts it has hired be trained reference librarians. In one case training for computerized searching occurred on the job, and in the other case the individual had previous experience. Both arrangements have proven satisfactory. But the ease (or perhaps luck) with which staffing has been accomplished should not be taken to suggest staffing is necessarily a trivial matter. We firmly believe that the search analyst's position is a full-time job requiring a trained reference librarian. If an organization cannot ensure a search analyst with these qualifications, we sincerely doubt it should consider offering a computerized information service. This restriction places a limitation on the number and types of organizations that might house or be integrated into the Educational Information System for Ontario.

A search analyst, however, cannot operate a search service alone. Clerical and secretarial staff are required to handle correspondence, fill orders, and maintain records. Without qualified support staff, a service could not be effective.

Supplementing the search service are external Educational Information Consultants (EICs), who have proven to be reasonably effective in linking EISO to boards and other agencies. These EICs, who are regular employees of the agencies in question, learn additional skills to help them to help others use EISO more effectively. Provision of EICs throughout Ontario might enable a centralized information system to reach into remote areas, though such a program would require a strong commitment both from EISO itself and from each EIC's organization, as well as considerable funds. Achieving such commitments would not be easy, and could probably be implemented only if highly respected and influential educators gave the program their full support.

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Resources

In addition to qualified staff, EISO requires a number of other resources. First are journal and microfiche collections. The survey of Canadian computerized information services described elsewhere in this report provides testimony to the difficulties that can arise when a service provides bibliographies for which back-up materials are not available. Second, inexpensive data communication systems must be available. In practice, this means access to a node of either the TYMSHARE or TELENET communications networks. In Ontario, only Toronto and Ottawa are currently provided with these services. Finally, EISO requires microfiche hardware such as duplicators, readers, and printers in order for clients to make full use of fiche materials.

In summary, there are three major factors to be considered when planning EISO's future organizational structure: clientele, staff, and available resources (see Table 57). All three are of critical importance, and failure to consider any one of them could seriously affect the long-term viability of the Educational Information System for Ontario. The final form EISO takes must ensure that the full range of clients are served, that qualified staff are employed, and that back-up materials are readily available.

Current Trends

In considering EISO's future, it is necessary to take into account trends occurring in the field of information science in Ontario and elsewhere. New sources of information become available every day and, in particular, the use of on-line interactive systems to retrieve bibliographic information is spreading throughout Canada at an incredibly rapid rate. These developments may affect the options available to EISO.

Canada

The survey of on-line bibliographic retrieval systems in Canada reported in Chapter 6 clearly demonstrates a trend toward the universal use of on-line systems in academic libraries. We feel it safe to predict that all main libraries in Ontario's 15 universities will have the service available within several years. In addition, the National Library of Canada and many federal and provincial government agencies have subscribed or will soon do so. However, this development does not necessarily mean

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TABLE 57 -- STAFF, CLIENTELE, AND RESOURCES AVAILABLE FOR SUPPORTING ON-LINE SEARH SERVICES IN ONTARIO

Model	Estimated Level of Inputs Currently Available		
	Staff	Clientele	Resources
1. Ministry of Education Centralized System	Medium	Medium	Medium
2. Ministry of Education Decentralized System	Low - Medium	Medium	Medium
3. Faculty of Education Information Network	Low - Medium	Low - Medium	Medium - High
4. School Board Educational Information Network	Medium - High	Medium	Low - Medium
5. OISE Operation of EISO	High	Medium - High	High
6. Independent Operation of EISO	Nil	Nil	Nil

that greater access to bibliographic information will be provided to educators outside University communities. Indeed, the survey indicated most universities impose a surcharge of between $10 and $30 for "outside" users. Also, the agencies surveyed reported that no attempt had been made to recruit clients from school boards. The two exceptions to this generalization were the Educational Information System for Ontario and the Information/Knowledge Research Centre, Faculty of Education, University of British Columbia. Both of these programs are somewhat similar in philosophy to the outward looking educational information centres that have developed in the United States during the past several years.

United States

Research and Information Services for Education (RISE) in Pennsylvania and San Mateo Education Resources Center (SMERC) in California are two of the best known American educational information centres. Both are financed largely by federal, state, and school-board funds; both collect and index research and curriculum materials from throughout their respective states; both supply information packets, printed bibliographies, and in-depth literature reviews in addition to on-line searches (see Appendices P and R).

Development of educational information services like RISE and SMERC must, of course, be considered in terms of the American educational context. In the United States, unlike Canada, the federal government plays a major role in stimulating specific educational programs. It created ERIC, which is the primary educational resource drawn upon by EISO, SMERC, and RISE. In addition, it has provided funds to encourage the dissemination of ERIC materials through information centres. At the same time, state governments in the United States play a relatively minor educational role and, with a few exceptions, leave most decisions up to local authorities. As a result, information centres like SMERC and RISE have developed, not in state agencies, but in boards of education at the local or county levels.

Implications

While the location of educational information centres in the United States is settled, the same cannot be said about Canada. Our tradition of strong provincial guidance in education would suggest a major role for ministries of education. Indeed, the Ontario Ministry of Education's support of EISO tends to confirm this view. Nevertheless, there are indications that other agencies are interested in the field.

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Two large boards of education in Ontario (Metro Toronto and North York) have evinced interest in subscribing to on-line bibliographic retrieval systems such as those used by EISO in order to minister to the information needs of their own employees and perhaps those of nearby or constituent boards. Both of these agencies have many of the prerequisites needed to mount a viable service -- staff, clientele and resources. Also, the OISE Library has initiated its own Research Information Service for Education (also called RISE), which is described further in Appendix S. The latter service provides bibliographic information and literature reviews of books and Canadian materials not indexed in ERIC or other computer-accessible bibliographic data bases. To some extent, these other initiatives in Ontario no doubt result from the stimulus provided by Ontario's Ministry of Education funding the EISO and Ontario Educational Research Information System (ONTERIS) projects. However, they do not represent an organized development of information services, and may in the end lessen Ontario's ability to ensure an equitable distribution of information resources throughout its educational community.

Forms of Alternative Organizations

We shall approach the discussion of various possible ways to organize the Educational Information System for Ontario in the future in three stages. Considered first are two fundamental assumptions which we make concerning the service, namely, that there should be some overall organization to the provision of educational information in Ontario, and that all regions of Ontario should have equal access to information. Second, we review the various organizations and agencies which have the potential to play a role in supplying information on a systematic basis. Included among these are the Ministry of Education and its Regional Offices, the Ontario Institute for Studies in Education and its Field Centres, the various faculties of education, school boards, and professional organizations. Each of these organizations is assessed in view of its clientele, staff, and resources, as well as its likely degree of participation in the system. Finally several alternative organizational forms are described and evaluated according to their ability to fulfill the information needs of Ontario educators.

In our opinion, the necessity of providing some overall coordination of information services to educators is of the utmost importance if equal

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accessibility to information is to be ensured. If larger boards and faculties of education initiate services for their own clientele, ignoring one another's existence, then redundancy is inevitable. At the same time, boards in remote locations may remain inadequately served. With a reasonable degree of central control and organization, resources can be used more efficiently, so that all may receive adequate service. That all should have equal access to information may go without saying; however, recent changes in grant legislation make it possible for boards with large assessed valuations per pupil to raise funds beyond the grant ceilings for relatively small increases in the mill rate. This feature increases the likelihood that large and wealthy urban boards will initiate new ventures such as information services that small boards with low levels of wealth cannot afford.

The major parties now involved or who may soon be involved in supplying bibliographic information services to the Ontario educational community include the Ministry of Education, academic institutions, school boards and professional organizations. Any one of these can easily obtain a computer terminal and subscribe to a search service, but few have the potential of offering a computer retrieval service with back-up materials.

Ministry of Education

The Ministry, with its nine regional offices spread throughout Ontario from Thunder Bay to Ottawa, provides an infrastructure which has the potential for supporting or being a major participant in a centralized information system. It maintains a central library in the Mowat Block at Queen's Park, Toronto, and each regional office has it's own resource centre or professional library. The potential of the regional offices is perhaps best represented by the Midnorthern Regional Office in Sudbury which has an Education Centre that is a major resource for all of Northern Ontario. However, an objective assessment of current clientele, staff, and resources of the Ministry and its regional offices suggests that it is currently unable to offer a complete information service.

Clientele. The clientele of the Ministry is composed almost entirely of professional educators. Personnel in school boards throughout the province have ready access to Ministry offices. This makes the regional offices ideal locations for information centres serving practitioners, if not academics. However, because education officers often have supervisory

and evaluative responsibilities, provision of research information by Ministry officials may not be consistent with their primary roles. Thus, if either the central Ministry office or regional offices became nodes in an information system, it would probably be preferable if an education centre was created in each office in order to ensure the information service's effectiveness.

Staff. Staffing would provide another barrier to the Ministry's deep involvement in an information service. The staff at the Ministry of Education are professional educators, but rarely do they possess the background in reference work and library science that would be needed. At least two exceptions to this rule exist: one is the Midnorthern Education Centre in Sudbury and the other is Queen's Park. These two locations could be integrated into an information system with relative ease. However, full involvement of Regional Offices in the Educational Information System for Ontario would require employment of trained reference librarians to act as search analysts at each site if maximum effectiveness were to be achieved.

Resources. As with staff, resources available at Ministry Offices for support of an information service are quite limited. Neither the regional offices nor the central office have a complete ERIC collection. In many cases, journal collections are also inadequate. Thus, for the Ministry to become centrally involved in providing information using interactive computer retrieval, it would be necessary for it to acquire back-up materials at considerable cost. Conservatively, annual subscriptions to approximately 1,000 journals and the purchase of the entire ERIC microfiche collection would be required. Assuming the average cost of the journals is $25 per year, 1,000 journal subscriptions would cost $25,000 annually, exclusive of ordering and cataloguing costs, and provision of retrospective materials. The ERIC fiche collection costs approximately $2,000 per year for vesicular copies and $4,000 per year for silver copies (which are better for duplication). The entire fiche collection to date costs $14,528 U.S. on vesicular film and approximately $28,000 in silver format. Again, ordering, cataloguing, and storage costs are extra. It appears that for an annual cost of approximately $27,000 (exclusive of all staff and overhead) the Ministry of Education could maintain a central store of materials to provide back-up materials to an information system. However, amassing a collection to cover the past ten years, the period covered on ERIC tapes, might cost ten times this amount.

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Communication costs also may impose a substantial barrier to incorporation of regional offices into a decentralized information system unless WATS lines were available. Currently, only Toronto and Ottawa have telecommunication nodes for major telecommunication systems like TYMSHARE and TELENET. Fortunately, all regional offices do have microfiche readers though their use would not be convenient for members of school boards. Finally, it should be noted that all regional offices have been supplied with copies of ONTERIS microfiches, an information resource which may be of growing importance in the coming years.

A synoptic assessment of the Ministry of Education's current ability to support or participate fully in either a centralized or decentralized Educational Information System for Ontario is presented in Table 57. For a centralized system, the Ministry rates medium for clientele (since academic users would be excluded), high for staff, and medium for resources. Given a decentralized system including all regional offices, the Ministry would be rated medium for clientele, low for staff (except Sudbury and Toronto), and medium for Resources, the lack of back-up materials being the critical shortcoming in the latter.

Faculties of Education

In considering the role that Ontario faculties of education might play in an information system, one is struck by their tremendous variety in terms of the character of their clientele, their staff, and their resources. Some faculties function only as teachers' colleges, while others have extensive research and professional development programs. However, all are equipped with libraries which could form the basis of an information service to a clientele broader than one composed only of the students and faculty they normally serve. As well, they could draw upon the expertise of their universities' main libraries, most of which are likely to be offering on-line services to their university communities in the near future. It is doubtful, however, that many of these libraries would consider educators in local boards to be a major clientele and one would expect they would charge these clients an extra fee to cover overhead costs of operating the system.

Faculty of education libraries do not currently have the staff that would be needed for complete utilization of an on-line search service, such as EISO provides. However, staff could be obtained and trained were funds available, and EISO's research findings would provide valuable aid, to assist their entrance into this field. Their resources would also have

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to be upgraded since only five of Ontario's universities (Queen's, Guelph, Western, Ottawa, and Brock) maintain ERIC microfiche collections, though all have microfiche readers available. Also, educational journal collections in many of the university libraries are not adequate to supply back-up materials needed for a complete information service. Were a decision taken to foster development of such services in faculty of education libraries, then a more complete assessment of the resources each possesses would first have to be completed in order to estimate the costs of acquiring additional materials needed to bring them up to an adequate standard. An overall assessment of faculties of education suggests that they rate as follows: clientele, medium since few practising educators are included; staff, high; and resources, medium.

School Boards

Several school boards are also potential sites for information services or service nodes. The City of Toronto, North York, and Toronto Metropolitan Separate School Boards all maintain professional libraries with complete ERIC microfiche collections, trained staff, and a clientele of professional educators. Each have a nucleus of a journal collection which could provide back-up materials for many references located in computer searches. But perhaps the greatest asset boards would have in initiating active information centres is their access to board research and administrative personnel. An internal information system could probably achieve a high level of usage far more easily than could an outside agency which must cross institutional boundaries in order to gain access to these personnel. Still, a considerable investment in staff training and supplemental back-up materials would be necessary.

The Metropolitan Toronto Board of Education is another agency that could play a role in an information system, a role which might develop naturally from its continuing tradition of research and service to the six boards (Scarborough, East York, North York, York, Etobicoke, and City of Toronto) that comprise the first tier of Metropolitan Toronto's two-tier system of educational governance. The Metro Board is one of few agencies with the trained staff necessary for an information service, but it lacks the materials needed to offer a complete system on its own. Limiting our assessment to the major boards mentioned, we find a medium level of access to clientele, a high level of staff capability, and a moderate level of resources.

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Professional Organizations

The Ontario Teachers' Federation and its constituent federations would no doubt be rational nodes in an information network. To date, however, we have not conducted an assessment of their preparedness for inclusion in such a system.

The Ontario Institute for Studies in Education

Finally, we consider the permanent role the Ontario Institute for Studies in Education might play in the Educational Information System for Ontario. It goes without saying that OISE has the staff, clientele, and resources needed to operate such a system, at least on a small scale, given that EISO has operated from OISE during its first two years. This is not to say that OISE alone could operate a maximally effective system. Still, OISE remains the one provincial institution that is capable of providing support to all facets of the Educational Information System for Ontario. To a large extent, the size of its role would depend upon the magnitude of the service.

Centralization vs. Decentralization

The opportunity now exists to plan the future organizational structure for providing educational information in Ontario. There are three alternatives which may be considered. The first choice is a fully centralized system which is administered by one agency. Such a system would have only one central location, as is the case with the Educational Information System for Ontario. It would have uniform policies, procedures and standards which would be administered by a central authority. The second choice is the creation of a network of information centres coordinated by a council or board drawn from constituent members that would have jurisdiction over matters such as the provision of back-up materials and the allocation of funds earmarked for the equalization of educational information services throughout the province. The final option is the complete decentralization of information services, with each information centre free to act independently of any other. No standard policies, procedures or practices would apply; each service would be fully financed by its host organization; and each would be responsible for the provision of back-up materials to its clients.

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How could each of these three options be implemented? What would their impact be on the provision of educational information in Ontario? In an attempt to answer these questions, the next sections relate the roles that the various educational agencies in Ontario might play under each of these three choices.

Centralized System

The most ambitious type of centralized information system would include a centrally located service that would be responsible for filling search requests and providing back-up materials for educators throughout the province. The service would be equipped with trained search analysts and computer terminals in order to fill search requests from educators. Each board or agency served by the one service would also be expected to appoint an Education Information Consultant who would be responsible for linking his organization with the local educational information centre.

There are perhaps a half-dozen agencies in Ontario which either have or could realistically develop the organizational structure and basic resources necessary to operate a complete information system like that described above, including the Ontario Ministry of Education, the Ontario Institute for Studies in Education, and several larger school boards and faculties of education. Back-up materials could be supplied in one of two ways: the creation of a journal and microfiche "warehouse" which would fill all orders for materials, much the way SMERC has done in California, or through contracting with OISE for the provision of materials, most of which are currently held by the OISE Library.

There are a number of advantages that would accrue to a centralized information system. First among these is expense. Only one set of publicity materials, one set of procedures and one set of back-up resources would be required. As shown in Chapter 5, the cost of creating two distinct search services is considerably greater than operating a single service with more than one search analyst. The second advantage of a centralized search service is its ability to set and maintain uniform standards, thereby ensuring that educators are well served throughout the province. Disadvantages of centralization include the fact that the financial burden for all fixed costs would fall on a single agency. Another difficulty that might occur with a centralized service is a lack of responsiveness to local needs. Such a failure might occur because of an emphasis that would likely be placed on uniform standards or its distance from and lack of familiarity with situations encountered by clients in outlying areas.

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Coordinated Network

Ideally, a coordinated network of information services would be composed of services located in various types of organizations serving different types of clients in all parts of the province. These might include faculty of education libraries serving academics, and school board education centres serving practising educators. Coordination of the services would be provided by a board or council which would, among other things, assess the accessibility of information in different regions and formulate recommendations to its members aimed at equalizing services. In all probability, a coordinated network would require an outside source of funds, such as the Ministry of Education. This would certainly be the case if its members were expected to provide services to educators in external organizations at the same rate charged to their internal clients. It might be necessary to create a system of subsidies to search services based on the volume of searches they conduct for clients in organizations not having their own services. The network would also require a source of funds for providing a central source of back-up materials.

Virtually all educational agencies might wish to participate in a coordinated network of the type described above. In practice, however, membership might be limited to larger school boards, faculties of education, professional organizations, OISE, and the Ministry of Education. Smaller agencies that would be unable to support an adequate information service would be served by the network, and equal access to educational information throughout the province would therefore be assured. At the same time, creation of a multitude of uneconomical small services would be prevented.

Complete Decentralization

A totally decentralized system for providing information to Ontario educators would consist of numerous information services scattered throughout the province in school boards, faculty of education libraries, and offices of government and professional organizations. As we have noted, this process has already begun.

Complete decentralization does have certain advantages over a fully centralized service. For example, clients find search services in their own organizations much more accessible than external ones. This phenomenon was noted earlier, when it was discovered that EISO's clients from the Ontario Institute for Studies in Education had a more positive view

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of the service than did those from outside of OISE. Also, an internal search service is more likely to have staff who are familiar with the problems faced by the members of the organization. While a centralized system's linkage agents or EICs can overcome this problem to some extent, they are not a complete solution to the problem. Finally, wholly independent search services can exercise complete control over their selection of clients and the type of service provided. In the long run, this may allow for greater specialization and excellence. On the negative side, the presence of a large number of search services in Ontario would fragment the market, and few services would have the volume of customers that is needed in order to reduce the cost per search to a defensible level. Indeed, since the total cost for a number of separate search services would be greater than the cost of a single search service designed to serve the same number of clients, the services would have to attract even more clients than would a single search service in order to equal its cost per search. In a situation such as this, an unhealthy competiton for clients might arise, and standards could fall. Finally, most independent services would be unable to provide substantial amounts of back-up materials. Their clients would be forced to turn to interlibrary loan services in order to acquire materials. With charges for interlibrary loans now approaching $10 per book, clients would pay dearly for the cost of inefficiency.

We have outlined three options for organizing the Educational Information System for Ontario in the future. In the first one, EISO remains a centralized system with facilities for the duplication of back-up materials. In the second option, EISO is replaced by a council whose purposes are (1) to coordinate the activities of a relatively small number of medium-sized information services that are separately financed and operated, (2) to allocate subsidies to the separate services, and (3) to finance a central duplication service to ensure that back-up materials are readily available. In the final choice, EISO is replaced by a large number of independent information services, each separately financed and operated. Each would also be responsible for providing back-up materials and setting its own standards, procedures, and practices, and there would be no assurance that all segments of Ontario's educational community would be equally served.

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Conclusion

In its first two years, the Educational Information System for Ontario has shown that a demand exists for the educational information contained in data bases which can be searched by computer, and that this information can be effectively disseminated. In at least a few cases, documented evidence is available showing that provision of information by EISO helped Ontario educators to develop and refine programs of education. Decisions must soon be taken concerning the provision of educational information if the momentum EISO has achieved is not to be lost.

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APPENDICES

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APPENDIX A: EISO User Evaluation Questionnaire

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EISO
Educational
Information
System
for Ontario
EISO Search Analyst
OISE Library, 5236
252 Bloor Street West
Toronto, Ontario M5S 1V6
(416) 923-6641 Ext. 457
User
Evaluation
Questionnaire

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Dear EISO User:

According to our records, you conducted a search through the Educational Information System for Ontario (EISO) during the last two months or so. As you know, this is an experimental service, and is part of a research project aimed at learning more about the information needs of Ontario educators, and how these needs can be met.

Could we impose upon you to complete the evaluation questionnaire and return it to us in the enclosed self-addressed and stamped envelope. The questionnaire should take no more than a few minutes to complete. All data will be held in strict confidence and used only for research purposes.

Many thanks for your cooperation.

Sincerely,

Ethel Auster, Stephen B. Lawton
Principal Investigators

P.S. If you requested the search on behalf of another user, please pass this questionnaire on to the individual concerned for completion.

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EISO User Evaluation Questionnaire

The data collected from the user evaluation questionnaire will be used only for research purposes. To identify and attract potentially interested users to EISO we must know who is now using the service; we must also identify and improve weak areas in the search service.

Search No. ⌊⌋⌋⌋⌋ ⌊⌋⌋ (1)

Topic _____

_____

Please read each question carefully and indicate your response with a check mark: ☑

If you have completed a previous evaluation questionnaire, please start at item 24 on page 7.

Personal Data

7,8 1. Age
(1) ☐ 25 or under
(2) ☐ 26 - 35
(3) ☐ 36 - 45
(4) ☐ 46 - 55
(5) ☐ 56 - 65
(6) ☐ over 65

2. Highest earned degree
(1) ☐ Bachelor's
(2) ☐ Master's
(3) ☐ Doctorate
(4) ☐ other certificate

9-10 3. Please indicate your primary professional role or function. (Check one only)
(01) ☐ Administration or Supervision
(02) ☐ Teaching
(03) ☐ Pupil Personnel Services
(04) ☐ Research
(05) ☐ Field Development
(06) ☐ Ministry Regional Office
(07) ☐ Library Services
(08) ☐ Private Consultant
(09) ☐ Undergraduate Student
(10) ☐ M.Ed. Student
(11) ☐ Ed.D. Student
(12) ☐ M.A. Student
(13) ☐ Ph.D. Student
(14) ☐ Other: _____

11 4. How many years have you been in your current position?
(1) ☐ less than one year
(2) ☐ 1 year
(3) ☐ 2 years
(4) ☐ 3 years
(5) ☐ 4 to 6 years
(6) ☐ 7 to 9 years
(7) ☐ 10 or more years

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12,13 5. Have you ever been an officer of a professional organization?
(1) ☐ Yes (2) ☐ No

6. Are you a member of any professional organization *other* than those required by provincial legislation?
(1) ☐ Yes (2) ☐ No

14,15 7. Have you written any professional papers for publication or for presentation at conferences in the last five years?
(1) ☐ Yes (2) ☐ No

8. Have you participated in an educational research project in the last five years?
(1) ☐ Yes (2) ☐ No

16 9. Are you now studying or planning to study toward an academic degree?
(1) ☐ Yes (2) ☐ Not sure (3) ☐ No

Organizational Characteristics

17,18 10. If you are with a school board, please indicate the level of your primary professional position. Otherwise, check "Not applicable".
(1) ☐ Elementary grades only
(2) ☐ Secondary grades only
(3) ☐ Elementary and secondary
(4) ☐ Central board office
(5) ☐ Other: _____
(6) ☐ Not applicable

11. What is the mother tongue of the majority of individuals served by your organization?
(1) ☐ English
(2) ☐ French
(3) ☐ Other: _____

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Information Needs

12. Please indicate (A) the amount of time per week you normally spend in obtaining information from each of the sources listed below, and (B) how valuable the information gained from each source is to you.

	Source	(A) Approximate Time Spent (hrs. per week)	(B) Value: Low	Medium	High	NA
18,20	a. Human resources	_____	☐	☐	☐	☐
21,22	b. Office files, reports	_____	☐	☐	☐	☐
23,24	c. Prof. organizations	_____	☐	☐	☐	☐
25,26	d. Libraries and their holdings– journals, books, indexes, etc.	_____	☐	☐	☐	☐
27,28	e. Conferences	_____	☐	☐	☐	☐
29,30	f. Prof. Dev. Days	_____	☐	☐	☐	☐
31,32	g. Academic, prof. courses	_____	☐	☐	☐	☐
33,34	h. Curric. guides, texts	_____	☐	☐	☐	☐
35,36	i. ERIC materials	_____	☐	☐	☐	☐
37,38	j. Other: _____	_____	☐	☐	☐	☐
			(1)	(2)	(3)	(4)

13. How often do you seek information for the following?

	Purpose	Frequency: Never	Sometimes	Often	Very often
39	a. To keep abreast in the field	☐	☐	☐	☐
40	b. Assignments, term papers, or theses	☐	☐	☐	☐
41	c. Preparing or updating bibliographies	☐	☐	☐	☐
42	d. Curriculum development	☐	☐	☐	☐
43	e. Program improvement	☐	☐	☐	☐
44	f. Preparation of speeches, reports, articles	☐	☐	☐	☐
45	g. Research and development projects	☐	☐	☐	☐
46	h. Browsing	☐	☐	☐	☐
47	i. Personnel recruitment or evaluation	☐	☐	☐	☐
48	j. Policy development	☐	☐	☐	☐
49	k. Other: _____	☐	☐	☐	☐
		(1)	(2)	(3)	(4)

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EISO Search Information

80-81 14. How did you first learn about the Educational Information System for Ontario (EISO) and its services? (Check one only)

(01) ☐ Brochure or flyer
(02) ☐ Advertisement
(03) ☐ Prof. Dev. Day
(04) ☐ Classroom instruction
(05) ☐ Colleagues
(06) ☐ Ed. Information Consultant
(07) ☐ Library or Librarian
(08) ☐ EISO staff member
(09) ☐ Cannot recall
(10) ☐ Other:

82,83 15. Is a microfiche reader available in your organization?

(1) ☐ Yes
(2) ☐ Don't know
(3) ☐ No

16. Portable fiche reader?

(1) ☐ Yes
(2) ☐ Don't know
(3) ☐ No

Please indicate your satisfaction with the following elements of EISO. Feel free to comment in the space provided.

		Satisfaction		
		Low	Medium	High
84	17. Convenience of arrangements and adequacy of directions to obtain EISO searches. Comments: _____	☐	☐	☐
85	18. Accuracy and comprehensiveness of publicity materials. Comments: _____	☐	☐	☐
86	19. Adequacy of directions for ordering copies of materials listed in bibliography. Comments: _____	☐ (1)	☐ (2)	☐ (3)

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57,58 20. Before using EISO, how helpful did you expect it to be?

(1) ☐ Not very helpful
(2) ☐ Somewhat helpful
(3) ☐ Very helpful

21. Would you recommend use of EISO to a colleague?

(1) ☐ Yes
(2) ☐ Perhaps
(3) ☐ No

59,60 22. Would you use EISO again?

(1) ☐ Yes
(2) ☐ Perhaps
(3) ☐ No

23. Do you think EISO search services be offered on a permanent basis?

(1) ☐ Yes
(2) ☐ Perhaps
(3) ☐ No

Those who have completed previous questionnaires, please start at this point.
Others, please continue.

61-62 24. Please indicate the professional role for which you requested this EISO bibliography. For example, if the bibliography was used to complete a course paper for your M.ED. you would check "M.Ed. student" although your primary professional role or function is in administration. (Check one only)

(01) ☐ Administration or Supervision
(02) ☐ Teaching
(03) ☐ Pupil Personnel Services
(04) ☐ Research
(05) ☐ Field Development
(06) ☐ Ministry Regional Office
(07) ☐ Library Services
(08) ☐ Private Consultant
(09) ☐ Undergraduate Student
(10) ☐ M.Ed. Student
(11) ☐ Ed.D. Student
(12) ☐ M.A. Student
(13) ☐ Ph.D. Student
(14) ☐ Other:

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63,64 **25.** How much did you learn about your topic as a result of the search?

(1) ☐ Nothing or very little
(2) ☐ Some
(3) ☐ A great deal

26. How much did you learn about the Educational Information System for Ontario as a result of your search?

(1) ☐ Nothing or very little
(2) ☐ Some
(3) ☐ A great deal

65 **27.** How much additional information do you still desire concerning the topic that was searched?

(1) ☐ Nothing or very little
(2) ☐ Some
(3) ☐ A great deal

28. How helpful was the information provided as a result of your EISO search for each of the following activities?

		Helpfulness			
		Low	Medium	High	NA
66	a. Keeping abreast of the field	☐	☐	☐	☐
67	b. Completing assignments, theses, etc.	☐	☐	☐	☐
68	c. Preparing or updating a bibliography	☐	☐	☐	☐
69	d. Curriculum development	☐	☐	☐	☐
70	e. Improving programs	☐	☐	☐	☐
71	f. Preparing a speech, article or report	☐	☐	☐	☐
72	g. Undertaking or completing a research or development project	☐	☐	☐	☐
73	h. Browsing	☐	☐	☐	☐
74	i. Recruiting and/or evaluating personnel	☐	☐	☐	☐
75	j. Developing policy	☐	☐	☐	☐
76	k. Other: _____	☐	☐	☐	☐
		(1)	(2)	(3)	(4)

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Please indicate your satisfaction with the following elements of your EISO search. Feel free to comment in the space provided below.

		Satisfaction			
		Low	Medium	High	NA
13	34. Time taken to deliver the EISO bibliography. Comments: _____	☐	☐	☐	☐
14	36. Time taken to deliver microfiche or paper copies ordered from EISO. Comments: _____	☐	☐	☐	☐
15	37. Time taken to deliver microfiche or paper copies ordered from EDRS. Comments: _____	☐	☐	☐	☐
16	38. Value of bibliography itself. Comments: _____	☐	☐	☐	☐
17	39. Value of materials located via EISO bibliography. Comments: _____	☐	☐	☐	☐
18	40. Availability of microfiche readers. Comments: _____	☐	☐	☐	☐
		(1)	(2)	(3)	(4)

10

00185

41. Please comment on both the good and bad elements of your EISO search. Any suggestions you make towards improving the service are welcome.

Thank you for your time and cooperation.

Please return completed questionnaire to:

EISO Search Analyst
OISE Library, S218
252 Bloor Street West
Toronto, Ontario M5S 1V6

11

C6186

APPENDIX B: EISO Service Evaluation Data Sheet

EDUCATIONAL INFORMATION SYSTEM FOR ONTARIO

Search No. _____

Topic _____

EISO SERVICE EVALUATION DATA-SHEET

C
3

Search Request

42. Rc'd. _____ (7) 43. Intvw. _____ (13) 44. Run _____ (19)

25-26 45. Purpose (01)__Keep abreast of field (07)__Research/development report
(02)__Assignment, term paper, thesis (08)__Browsing
(03)__Prep., update of bibliography (09)__Personnel recruit, eval., sup.
(04)__Curriculum development (10)__Policy development
(05)__Program improvement (11)__Other: _____
(06)__Prep. speech, article, report _____

27 46. Contact (1)__In person (2)__Phone (3)__Mail

47. Earliest yr. rq'd. _____ (28) 48. No. ref. rq'd. _____ (30) 49. Ref. exp. _____ (34)

50. Cit. known _____ (38) 51. Price _____ (40)

42 52. Payment (1)__Cash or cheque (2)__Invoice (3)__Cost recovery

Charge for search

43 53. Who pays (1)__EISO (free) (2)__Requestor (3)__Organ.
(4)__Other _____

54. OISE charge Unit _____ (44)

Search

49 55. Intvw., strat. time _____ (46) min. 56. System (1)__SDC (2)__Lockheed

50 57. Data base (1)__ERIC (2)__Psych. Abs. (3)__SSCI (4)__ECEA
(5)__Diss. Abs. (6)__ERIC + PA (7)__ERIC + ECEA (8)__ECEA + PA
(9)__Other: _____

58. Connect time _____ (51) min. 59. Cit. Printed _____ (54) 60. Cost/cit. _____ (58)

00198

EISO Evaluation Data-sheet (2)

61 61. Bib. sent (1)__Requestor (2)__Search Analyst (3)__EIC (4)__Other:_____

62. Date bib. rc'd. ____ (62) 63. Cost/hr system ____ (68)

Material Charge

71 64. Payment (1)__Cash or cheque (2)__Invoice

72 65. Who pays (1)__EISO (2)__Requestor (3)__Org. (4)__Other:_____

66. OISE Charge Unit ____ (73)

C
4 Materials

67. N EISO fiche ordered ____ (7) 68. N EISO art'cl ordered ____ (10)

69. N EISO fiche orders filled by OISE ____ (13)

70. N EISO fiche orders filled by other libraries ____ (16)

71. N EISO fiche orders unfilled ____ (19)

72. N EISO art'cl orders filled by OISE ____ (22)

73. N EISO art'cl orders filled by other libraries ____ (25)

74. N EISO art'c! orders unfilled ____ (28)

31 75. EISO reader av'lbl (1)__Yes (2)__Don't know (3)__No

76. Price first search ____ (32)

77. Please indicate the type of organization or institution with which user is primarily associated by placing a check (✓) in the appropriate space below.

34-35
(01)__preschool
(02)__public board
(03)__separate board
(04)__private school or board
(05)__CAAT
(06)__Faculty of Ed. or Teachers' College
(07)__University

00199

(08)___Ministry of Education
(09)___Professional Organization
(10)___Government (Not Ministry of Education)
(11)___Business or Industry
(12)___OISE Director's Office/Assistant Director's Office
(13)___Finance
(14)___Computing Service
(15)___Publications
(16)___Library
(17)___R & D
(18)___Educational Administration
(19)___Applied Psychology
(20)___Adult Education
(21)___History & Philosophy
(22)___Computer Applications/Measurement & Evaluation
(23)___Curriculum/Modern Language Centre
(24)___Educational Planning
(25)___Special Education
(26)___Sociology in Education
(27)___Graduate Studies
(28)___Field Development
(29)___Other:_____.

78. Is the organization located in

36-37

(01)___District or District Municipality
(02)___County or Regional Municipality
(03)___Metro Toronto
(04)___Ottawa
(05)___London
(06)___Hamilton
(07)___Windsor
(08)___Sudbury
(09)___Canada (outside Ontario)
(10)___Outside Canada

79. Is the organization located in the Northeastern Region (Region 3) of the Province of Ontario?

38,39

(1)___Yes (2)___No

80. What is the community the organization serves?

(1)___Mostly rural
(2)___Equally rural and urban
(3)___Mostly urban

C0190

81. Who designed the search request?

40
(1)___Search Analyst
(2)___OISE Field Centre EIC
(3)___Faculty of Education EIC
(4)___Ministry of Education EIC
(5)___CAAT EIC
(6)___Not sure
(7)___Other:_____

41 82. Sex (1)___Male (2)___Female

00191

APPENDIX C: Adminnovation Article

ADMIN INNOVATION

with Robert O'Neill

EISO *: INFORMATION FOR ACTION

Bob O'Neill is Superintendent of Development for the London and Middlesex County Roman Catholic Separate School Board. Ruth von Fuchs is the Search Analyst for the Educational Information Service for Ontario, based at OISE.

Editor: I understand you've used the EISO service a number of times. What does it do for you?

O'Neill: Well, for one thing, EISO provides bibliographies with abstracts that are a convenient and fast method of collecting background information that I need, or that one of my people needs to do a curricilum project.

Editor: How do you go about requesting information from EISO?

O'Neill: I just pick up the phone and dial the number to get the EISO search analyst, and we work out the search strategy until it feels comfortable to both of us. This is a process of identifying the specific concepts or parameters of the search — narrowing the field by prioritizing the aspects of the problem. Then they plug into the computer system to search either the Educational Resources Information Centre (ERIC) data base, or one of the others that's available, such as *Psychological Abstracts*.

Editor: How has it been useful in your job?

O'Neill: One of the best examples concerns our outdoor education program, which we wanted to extent. I plugged into EISO and ran a search on outdoor education programs. Our outdoor education teacher is now scanning the bibliography — there were 117 citations — to pick up what is valuable to him. I've already scanned it, and we'll take a look at it together in order to develop an idea of what we ought to read and what we ought to do. If a decision is made to revamp the program, a committee will be formed and they'll have the background data available right away. They feel comfortable with that — and it makes my job much easier since when people come to my office with a curriculum problem, they expect some kind of background information.

As an administrator, just reading the abstracts on EISO bibliographies gives me a good feel for trends. It also gives me an idea of the resources a committee might need, or that the implementation of a proposal might require. But EISO's major use for teachers, resource personnel, and coordinators, is for getting background information very quickly.

Editor: How quickly?

O'Neill: Within a week or ten days.

Editor: Has EISO saved you money? Can you give me a specific example?

O'Neill: I think I could give you several. One was a search dealing with teacher evaluation. Using the abstracts and subject headings (they call them "descriptors") I was able to select three or four representative types of policies and guidelines, bring them together very quickly, look at local practices, and make recommendations to Administrative Council. This saved the cost of staff salaries that might otherwise have been spent.

Editor: Would other levels of educators find the service useful?

O'Neill: I've shared the concept with other people and find that they accept it readily. I think the heaviest user would be the curiculum coordinator or consultant. They're in staff positions and don't have line authority, so they have to depend on their expertise for authority. I think that's good, but it's nerve-wracking for them to have to say, "I've looked into this, but I'm not sure I've exhausted all the possibilities." Now, they're not going to get everything that was ever written out of an EISO search, but at least they're able to identify major trends so they can proceed with a pretty good background.

I'd like to see an EISO search request become a budget item for coordinators' use. Principals might conduct searches too, but in curriculum matters they usually rely on coordinators for the knowledge they can bring.

One caution: I think you have to be aware of the fact that there are some periodicals and, of course, some books in the field of education that aren't yet included in the data bases searched by EISO.

Editor: I understand your Board is one of the first to adopt the use of the EISO search service as a regular method of obtaining information. How did you get started?

O'Neill: Well, I had a curriculum problem and I phoned OISE and asked for some help. Someone there told me about OISE — the literature hadn't been distributed yet — so I phoned the search analyst, talked about the problem, and ran a search. From that point on I haven't looked back in terms of using the service.

As for the Board, we've adopted curriculum building models in the schools, and we have good resources and staff. So there's both a demand for information and the capability to use it.

Editor: What about access to documents and articles mentioned in the EISO print-out. .do you order these from EISO?

O'Neill: No, I haven't had to, personally. Althouse College has an ERIC microfiche collection in its library and I have access to original documentation there. If a person didn't have the local resources that London and Middlesex have, I can see that provision of articles and microfiches would be an important part of the service. The only problem is getting paper copies of microfiche documents. These have to be ordered through ERIC Documentation Service in the U.S.; and that's not very convenient if you only want a page or two.

Editor: Doesn't the $30 charge for an EISO bibliography seem a bit high?

O'Neill: Not if you think in terms of salary output to do the same job. At my salary, for example, the cost would be horrendous. But even in terms of the cost of paraprofessional staff, EISO's charge is an inexpensive investment, especially when you see what your personnel can do with the information provided.

* * *

*EISO, The Educational Information Service for Ontario, is a research project at The Ontario Institute for Studies in Education, funded under contract with the Ministry of Education, Ontario.

For further information, contact:

EISO Search Analyst
OISE Library, S218
252 Bloor Street West
Toronto, Ont. M5S 1V6
(416) 923-6641, Ext. 487

APPENDIX D: Lockheed DIALOG Information Retrieval Service

LOCKHEED DIALOG® INFORMATION RETRIEVAL SERVICE

Rate Changes and Discount Schedules
(Effective January 1, 1977)

Over the past five years, with your help, encouragement, and support, the DIALOG service has grown tremendously – from 3 databases in 1972 to over 50 databases today. At the same time, we have evolved to our recently activated dual IBM 360/65 system – a large and extremely cost-effective system. As a consequence, we are most pleased to share with you these economies through a program of reduced rates and volume discounts which will go into effect for all DIALOG customers on January 1, 1977. Also, an optional minimum and group contract programs are available which can provide additional savings. The following summarizes these changes; details are included on the enclosed schedule.

- Reduced Rates. Chemical Abstracts CONDENSATES from $45 to $35 per connect hour. BIOSIS Previews from $65 to $45 per connect hour. TYMNET and TELENET will be reduced from $10 to $8 and from $8 to $5, respectively, for the United States Canada, and Mexico.
- Standard "No Minimum" Discount Service. Beginning January 1, in addition to the above rate reductions, each password which accumulates at least 5 hours of service per month will earn a discount based on total monthly usage (e.g., $5/hr for 5-9.99 hours; up to $15/hr for usage in excess of 80 hours per month). Usage on any or all of our 50 databases will count in determining the discount.
- Special Minimum Monthly Contract. Those customers who are able and willing to guarantee as little as $200/month search time will be provided a special contract form on written request. The minimum monthly contract will allow you to obtain even greater discounts as described on the attached schedule.
- Special Minimum Monthly Group Contract. Group discount contracts are available in even multiples of 5 passwords. The basic contract (5 passwords) requires a $500 monthly group minimum, with higher discounts available for higher monthly guarantees.

Consistent with past policy, all years of all databases will be continuously available online to provide for maximum interaction and convenience. Also, the rates and discounts described are applicable to all customers – industry as well as Government and not-for-profit organizations. We invite you to price out your search requirements (or call us – 800/227-1960 – and we will). We predict you will find that DIALOG gives you more for less.

Lockheed Information Systems
Code 5208/201
3251 Hanover Street
Palo Alto, CA 94304

Toll Free Numbers:
Continental U.S. 800-227-1960
California 800-982-5838
Other 415-493-4411 x 45412
Telex 346409

December 1, 1976

RATE REDUCTIONS

The following rate changes apply for all DIALOG Retrieval Service customers:

	Rate per Hour Old	Rate per Hour New
Chemical Abstracts CONDENSATES (1970-71, and 1972-76)	$45	$35
BIOSIS Previews	65	45
TYMSHARE TYMNET access	10	8
TELENET access	8	5

DISCOUNTS – STANDARD SERVICE (No minimums)

The following discount schedule is applicable to the total monthly search hours billed to a single DIALOG password. Billed connect time on any or all databases counts in determining the appropriate discount amount. Discounts are computed incrementally, increasing with blocks of usage, and are automatically applied to each password. No advance payment is required, and no minimum usage per month is required.

Hours Billed Per Month	Discount per Hour Billed*
0.00-4.99	$ 0.00
5.00-9.99	5.00
10.00-19.99	9.00
20.00-39.99	12.00
40.00-79.99	14.00
80.00+	15.00

EXAMPLE In a given month, a DIALOG searcher accumulates twenty-six hours of connect time in various databases. The discount is determined by our accounting system as shown, with the result deducted from the bill.

Hours	Discount Rate	Discounted Hours	Discount Applied
0.00-4.99	$ 0.00	5	$ 0.00
5.00-9.99	5.00	5	25.00
10.00-19.99	9.00	10	90.00
20.00-26.00	12.00	6	72.00
TOTAL		26	$187.00

The total discount for the 26 hours is $187.00. If the 26 hours were used to search a file such as ERIC, then the total search cost would be $463.00 (26 hr × $25 - $187.00), an effective cost of slightly less than $18.00 per connect hour.

Additional savings are available through a guaranteed monthly minimum contract, as shown on the reverse side.

*Discounts apply only to database connect hours and not to telecommunication charges and/or charges for off-line prints.

DISCOUNTS – MINIMUM GUARANTEE

This rate schedule is available by way of separate contract to DIALOG users who guarantee a minimum connect time payment of $200.00 a month or more. The discount per hour is determined by the amount of the guarantee and the total number of hours used. The advantage over the standard discount is that all search hours billed each month receive at least the discount stipulated in the contract. Contracts should be requested in writing from Customer Services. Requests should state guarantee level (e.g., $200, or $400, or $800, or $1600, or $3200), and period (6 months or 1 year) desired. Advance payment is not required, and guarantee levels can be increased on 30 days notice from customer.

Hours Billed per Month	Guaranteed Monthly Minimum*				
	$200	$400	$800	$1600	$3200
	Discount per Hour Billed				
0.00-4.99	$5.00	$9.00	$12.00	$14.00	$15.00
5.00-9.99					
10.00-19.99	9.00				
20.00-39.99	12.00	12.00			
40.00-79.99	14.00	14.00	14.00		
80.00+	15.00	15.00	15.00	15.00	

EXAMPLE: A DIALOG searcher signs a contract guaranteeing payment for no less than $400.00 per month. The following month, 26 hours of connect time are billed against the password. The discount is determined by our accounting system as shown, with the result deducted from the bill.

Hours Billed	Discount Rate	Discounted Hours	Discount Applied
0.00-4.99	$ 9.00	5	$ 45.00
5.00-9.99	9.00	5	45.00
10.00-19.99	9.00	10	90.00
20.00-26.00	12.00	6	72.00
TOTAL		26	$252.00

With the contract, the total discount is $252.00, an increase of $65.00 as compared to the standard discount of $187.00. Again, if the 26 hours were used to search ERIC, then the total search cost would be $400.00 (26 hr × $25.00 - $252.00 = $398.00→ $400.00 with minimum), an effective cost of slightly more than $15.00 per connect hour.**

*The dollar amount specified in the guaranteed monthly minimum is for connect time, including royalties. Charges for telecommunications and/or off-line prints do not count toward the guaranteed monthly minimum or the discount applied.

**An earlier version of this example carried an erroneous total search cost of $398. Please note the correct version (i.e., $400) above.

GROUP DISCOUNTS – MINIMUM GUARANTEE

For those who wish to take advantage of the discounts associated with a minimum guarantee contract but require multiple passwords, we offer a group contract. In this type of contract, all group usage counts toward the discount irrespective of use by individual passwords in the group. The group administrator is mailed a summary invoice for group members (to which the discount is applied) together with individual invoices for each password.

The basic group consists of 5 passwords and requires a group minimum of $500 per month. Discounts are based on the amount of the guarantee, and the total hours billed, as with other DIALOG contracts. That is, a $500 guarantee with 5 passwords gets a $5/hr discount on the first 49 hours of service and a $9 discount on hours 50-99 (if used). Similarly, a $1000 guarantee with 5 passwords gets a $9/hr discount on the first 99 hours billed, and a $12 discount on hours 100-199. Thus, the minimum average requirement for a group contract is $100 per month per password.

Groups can be increased initially or during the course of a contract in even multiples of 5 passwords (i.e., 5, 10, 15..., etc.). For each successive level of 5 passwords required, the minimum corresponding to each discount column doubles as do the hour ranges on which the discount is applied. Minimums can also be increased during the course of a contract to accommodate increased usage thereby deriving greater discounts. The table and example below clarify this contract option.

Hours Billed per Month	Guaranteed Monthly Minimum				
	$500	$1000	$2000	$4000	$8000
	Discount per Hour Billed				
0-49	$ 5.00	$ 9.00	$12.00	$14.00	$15.00
50-99	9.00				
100-199	12.00	12.00			
200-399	14.00	14.00	14.00		
400+	15.00	15.00	15.00	15.00	

- BASIC GROUP DISCOUNT RATES (5 PASSWORDS)

EXAMPLE: All American University in College City, U.S.A. has 5 branch libraries and 4 reference desks. They decide to obtain discounts through the DIALOG system group contract for 9 passwords (i.e., Level 2: 6-10 passwords). Since AAU typically does from $2800-3500 worth of business per month, they guarantee a volume of $2000 billable per month. The applicable discount rates are shown below.

During the first month, 73 connect-hours are logged for a total dollar volume of $3285 at standard rates (including royalties). The appropriate discount per hour billed for all connect hours up to 199 is $9.00. For 73 hours, the discount is thus $657 (73 × $9). The billable total for the month is $2628 ($3285-$657).

During December, because of holidays, only 48 hours of DIALOG searching was completed, totalling $2416 at standard rates. The discount applied is still at the $9 level and is $432 for 48 hours of searching. This brings the total to $1984 ($2416-$432). Because of the guaranteed minimum contract, the amount actually billed is $2000.

In June, a total of 213 search hours are logged on DIALOG placing the discounts at the $9 level for the first 199 hours and $12 for hours 200-213. Standard search costs for the databases searched amount to a total of $8307. The discount for these 213 hours is thus $1956 (200 × $9 + 13 × $12), resulting in a net billing of $6351. Discounts, of course, will be computed automatically on monthly invoices.

GROUP LEVEL 2 (6-10 PASSWORDS) $2000/MONTH MINIMUM

Hours Billed per Month*	$2000 Minimum*
0-99	$ 9.00
100-199	
200-399	12.00
Etc.	Etc.

*Note: These values are simply double the basic contract values since 9 passwords require a Level 2 group.

Please send for a contract form stating desired number of passwords, monthly group minimum, and contract term (6 months, 1 year). Or please call 800/227-1960 (800/982-5838 in California) and we will be pleased to work out what is appropriate for your group.

December 1, 1976

EISO

Educational Information System for Ontario

EISO Search Analyst
OISE Library, S218
252 Bloor Street West
Toronto, Ontario M5S 1V6
(416) 923-6641 Ext. 487

Printed in Canada
February 1977

EISO

198

Educational Information System for Ontario

Have You Heard About EISO?
Chances are you face problems now where additional information would be of help. If so, the Educational Information System for Ontario (EISO) project is ready to assist by locating and duplicating materials contained in the collection of the Educational Resources Information Center (ERIC), and other data bases of interest to educators.

What Is ERIC?
ERIC is an information gathering and disseminating network comprised of 16 subject-specialised clearinghouses operating under the auspices of the U.S. National Institute for Education. The clearinghouses collect, index and abstract research reports, conference papers, curriculum materials and handbooks, including many from Canadian sources, and announce them monthly in *Resources in Education (RIE)*. They also index more than 700 journals, including 26 from Canada, for the *Current Index to Journals in Education (CIJE)*. In all, the ERIC data base includes over 200,000 references, to which almost 2,500 new references are added each month.

How Can EISO Help?
By searching the ERIC data base for information on a particular problem or area of interest, you can learn how others have approached the issue. EISO provides direct access to ERIC, retrieving references quickly and inexpensively. Computerized searches of Dissertation Abstracts, Exceptional Child Education Abstracts, Psychological Abstracts, Social Science Citation Index and Sociological Abstracts are also available. The service will be of particular help to those working under the pressure of deadlines. For public addresses and research reports EISO will prove helpful; for planning and decision-making it may prove indispensible.

How Does EISO Work?
A search request is submitted to the search analyst, a specially trained reference librarian in the OISE Library, who rewords the content to conform to a list of subject headings designed for computer scanning of the data base. Via a computer terminal, the search analyst queries the data base. When combinations of subject headings are entered (e.g. remedial reading AND teacher aides), the number of relevant citations and sample citations are printed on-line. If the citations are appropriate, the complete set of references and abstracts are printed off-line and mailed to the requestor.

How Long Does a Search Take?
The computer search itself normally takes fifteen minutes, but follows a half-hour's discussion with the search analyst whenever possible. The bibliography usually arrives within ten working days of receipt of a search request.

How Much Does a Search Cost?
The current charge for a complete literature search, including consultation and printed bibliography is $30.00.

How Do I Obtain Documents and Articles?
Documents are available on microfiche from EISO at a charge of 35¢ per fiche, while paper copies are available from the ERIC Document Reproduction Service (EDRS) in the United States. Paper copies of journal articles are available from EISO at a charge of 10¢ per page. Order forms for both documents and articles will be sent to clients with the EISO bibliography.

How Do I Request a Search?
Complete the EISO Search Request Form on the opposite page and mail it to the address below; phone the search analyst at (416) 923-6641 ext. 487; or make an appointment with the search analyst at the EISO Search Service Office located in the OISE Library on the second floor of the OISE building.

Current Awareness Service
If you need regular updates on your search topic, ask the search analyst about EISO's new current awareness service. Charges will vary with the complexity of your search profile.

How Can Clients Assist EISO?
Besides providing a useful service, EISO is also a research project looking into the information needs of Ontario's educators. It will be greatly appreciated if clients complete evaluation questionnaires or agree to be interviewed, if asked to do so.

*Project funded under contract with the Ontario Ministry of Education: Ethel Auster and Stephen Lawton, Principal Investigators.

Name _____

Address _____

_____

Phone ( ) _____

Invoice (if cheque payable to EISO is not enclosed):

_____

_____

_____

Search Topic:

Grade level(s) _____

Detailed description of topic _____

_____

_____

_____

_____

Reasons for requesting search (Please be specific, giving examples of how you hope to use the information):

_____

_____

_____

_____

_____

Citations for relevant materials known to you, if any:

_____

_____

_____

Please mail completed search application to:

EISO Search Analyst
OISE Library, S 218
252 Bloor Street West
Toronto, Ontario M5S 1V6

200

APPENDIX F: EISO Order Form for Photocopies of Journal Articles. Instructions

Educational Information
System for Ontario
OISE Library, S 218
252 Bloor Street West
Toronto M5S 1V6
(416) 923-6641 ext. 487

Order Form for Photocopies of Journal Articles

Instructions

1

For each article desired, enter journal information on the grid on the following page. Samples below show where information required is listed on the printout of your bibliography and how it should be listed on the order form.

Sample Printout item:

EJ137100 TM502226
Creativity and Body Image Boundaries
Loshak, Lee J.; Reznikoff, Marvin Journal of Personality Assessment; 40; 1; 81-90 Feb 76
Descriptors: *Creativity/ *Body Image/ *Individual Characteristics/ *Creativity Tests/ Higher Education/ Males/ College Students
Studies creativity as it relates to body image, and examines the communality of several creativity measures. (RC)

Sample Order Form line:

Journal Name	Vol. No.	Issue No.	Page(s)	Date
Journal of Personality Assessment	40	1	81-90	Feb 76
SAMPLE				

2

Complete address section of form on the following page (search number if given at top right corner of pink copy of Search Request Form and also on the first page of the printout of your bibliography).

3

Retain 3rd (pink) copy of Order Form for your records.

4

Mail remaining copies to EISO.

5

When we reply stating cost of order, send cheque or money order payable to EISO. The photocopies will then be sent to you.

APPENDIX G: EISO Order Form for Photocopies of Journal Articles

Educational Information
System for Ontario
OISE Library, S 218
252 Bloor Street West
Toronto M5S 1V6
(416) 923-6641 ext. 487

Order Form for Photocopies of Journal Articles

Journal Name	Vol. No.	Issue No.	Page(s)	Date

SHIP TO:

Name_____

Address_____

_____

_____

_____

Phone ( )_____

Date_____

Search No._____

1) EISO

APPENDIX H: EISO Order Form for Microfiche Copies of Documents

Educational Information
System for Ontario
OISE Library, S 218
252 Bloor Street West
Toronto M5S 1V6
(416) 923-6641 ext. 487

Order Form for Microfiche Copies of Documents

Instructions

1. Enter ED numbers in columns below
2. Complete address section at bottom left (search number is given at top right corner of pink copy of Search Request Form and also on first page of the printout of your bibliography)
3. Retain 3rd (pink) copy of Order Form for your records
4. Mail remaining copies to EISO
5. When we reply stating cost of order, send cheque or money order payable to EISO. The microfiche copies will then be sent to you.

SHIP TO:

Name_____

Address_____

_____

_____

_____

Phone ( )_____

Date_____

Search No._____

ED Numbers	ED Numbers	ED Numbers

1) EISO

APPENDIX I: EISO Order Form for Paper Copy of ERIC Documents

Educational Information System for Ontario
OISE Library, S 218
252 Bloor Street West
Toronto M5S 1V6
(416) 923-6641 ext. 487

Order Form Paper Copy of ERIC Documents

From:
ERIC Document Reproduction Service
P.O. Box 190, Arlington, VA 22210
Phone (703) 841-1212

SHIP TO:

Name _____

Address _____

_____

Phone ( ) _____

Cheque or money order in U.S. funds payable to EDRS must be enclosed.

Date _____

ED Number	No. of Pages	Cost
		$
		$ Postage
		$ Total

Prices

No. of Pages	Price
1-25	$1.58
26-50	$1.95
51-75	$3.32
76-100	$4.43
Each additional 25 pages	$1.27

Postage:

First 60 pages	$1.00
Each additional 60 pages	$0.50

11 EDRS

APPENDIX J: EISO Search Authorization Form

EDUCATIONAL INFORMATION SYSTEM FOR ONTARIO (EISO)

Search Authorization Form
(Cost Recovery for OISE Staff and Students)

Requestor _____

Search No. _ _ _ _ _ _ _ _

Unit or Dept. _____

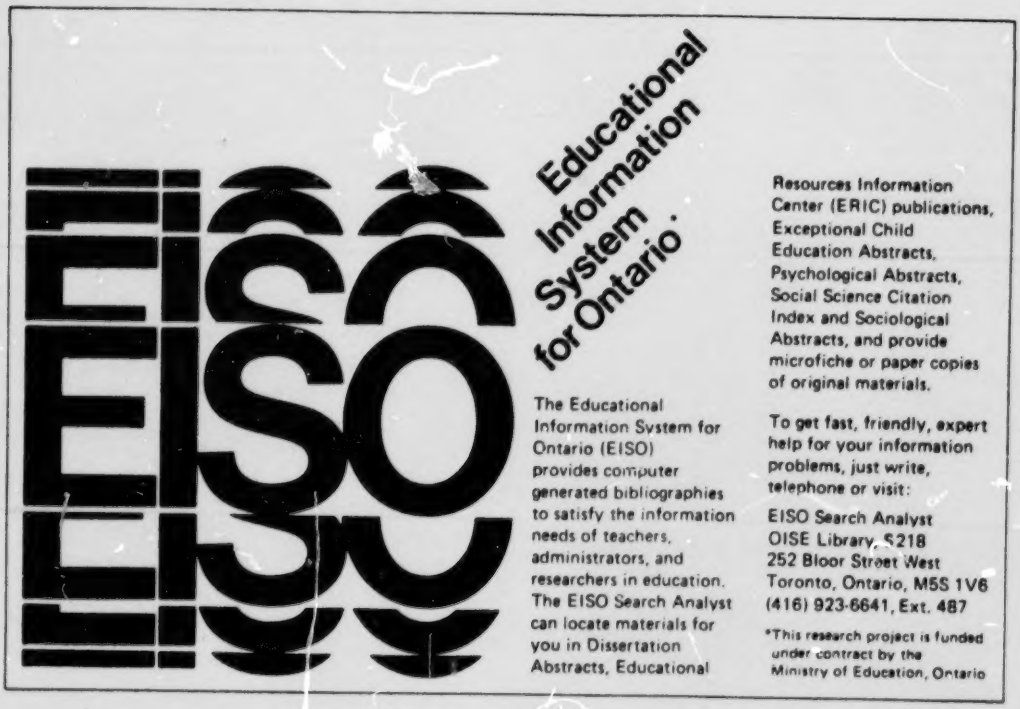
Authorization by Administrative Officer or Unit Head _____

Account to be Charged _ _ _ _ _ _ _ _ _ _ _ _ _ _
(Line Item) (Project No.) (Dept. No.)

Date _____

REQUESTOR COPY

APPENDIX K: Journal Advertisement for EISO


EISO
Educational Information System for Ontario
The Educational Information System for Ontario (EISO) provides computer generated bibliographies to satisfy the information needs of teachers, administrators, and researchers in education. The EISO Search Analyst can locate materials for you in Dissertation Abstracts, Educational Resources Information Center (ERIC) publications, Exceptional Child Education Abstracts, Psychological Abstracts, Social Science Citation Index and Sociological Abstracts, and provide microfiche or paper copies of original materials.
To get fast, friendly, expert help for your information problems, just write, telephone or visit:
EISO Search Analyst
OISE Library, 5218
252 Bloor Street West
Toronto, Ontario, M5S 1V6
(416) 923-6641, Ext. 487
*This research project is funded under contract by the Ministry of Education, Ontario

APPENDIX L: Poster for EISO

Time is money, the saying goes.

EISO

Consider, for instance, the time it takes to search through indexes like *Resources in Education* or *Psychological Abstracts* for all the references about the topic you are working on.

A computer can do that searching in less than one-tenth of the time it would take you to do it manually.

Is the 90% time saving worth $30 to you or to the organization sponsoring your work? If it is, contact:

EISO Search Analyst
OISE Library, S218
252 Bloor Street West
Toronto, Ontario M5S 1V6
Phone: (416) 923-6641 Ext.487

Journal Reference

ERIC ACCESSION NUMBER	EJ080471
CLEARINGHOUSE ACC NO	AA617272
AUTHOR	TIMMONS, JUDITH
TITLE	USING PARAPROFESSIONALS IN THE ELEMENTARY SCHOOL READING PROGRAM
PUBLICATION DATE	DEC 73
SOURCE	KAPPA DELTA PI RECORD 10 2 57
DESCRIPTORS	*ELEMENTARY SCHOOLS
DESCRIPTORS	*PARAPROFESSIONAL SCHOOL PERSONNEL
DESCRIPTORS	*TEACHER AIDES
DESCRIPTORS	*READING PROGRAMS
DESCRIPTORS	*PERSONNEL SELECTION
DESCRIPTORS	INDIVIDUALIZED PROGRAMS
DESCRIPTORS	REMEDIAL READING PROGRAMS

Document Reference

ERIC ACCESSION NUMBER	ED037879
CLEARINGHOUSE ACC NO	EC006441
TITLE	PROJECT FOR PREPARING TEACHER AIDES TO FACILITATE A TUTORIAL READING PROGRAM WITH EMPHASIS ON PERCEPTUAL TRAINING FOR PRIMARY SCHOOL AGE CHILDREN OF LOW SOCIOECONOMIC STATUS. FINAL REPORT
PUBLICATION DATE	FEB 70
ISSUE	RIEPDAUG
INSTITUTIONAL NAME	VIGO COUNTY SCHOOL CORP TERRE HAUTE IND
EDRS PRICE	EDRS PRICE MF $0.65 HC $3.29
DESCRIPTIVE NOTE	23P
DESCRIPTORS	*DISADVANTAGED YOUTH
DESCRIPTORS	*EXCEPTIONAL CHILD EDUCATION
DESCRIPTORS	PERCEPTUAL MOTOR LEARNING
DESCRIPTORS	PRIMARY EDUCATION
DESCRIPTORS	PROGRAM GUIDES
DESCRIPTORS	*REMEDIAL READING PROGRAMS
DESCRIPTORS	*TEACHER AIDES
DESCRIPTORS	*TUTORIAL PROGRAMS
ABSTRACT	DESCRIBED IS A TRAINING PROGRAM TO PREPARE TEACHER AIDES TO TUTOR IN A REMEDIAL READING PROGRAM FOR CHILDREN OF LOW SOCIOECONOMIC STATUS. INSTRUCTION EMPHASIZED EARLY CHILDHOOD GROWTH AND DEVELOPMENT, VISUAL MOTOR PERCEPTION TRAINING, LANGUAGE AND AUDITORY DEVELOPMENT, AND EMOTIONAL AND SOCIAL DEVELOPMENT. TRAINEE SELECTION, THE TRAINING PROGRAM, ITS USE IN THE REGULAR SCHOOL PROGRAM, AN EVALUATION OF THE PROJECT, AND RECOMMENDATIONS ARE DISCUSSED. THE COURSE CURRICULUM, WITH SUGGESTED TEACHING TECHNIQUES, MATERIALS, AND APPROACHES TO CLASSROOM MANAGEMENT, IS INCLUDED. (JM)

The Use of Teacher Aides in Remedial Reading
Partial Printout

APPENDIX M: User's Guide to EISO

ESO Search Analyst
OISE Library, S218
252 Bloor Street West
Toronto, Ontario M5S 1V6
(416) 923-6641 Ext. 457

This Research Project Is Funded Under Contract
By The Ministry Of Education Ontario
Ethel Auster and Stephen Lawton, Principal Investigators
The Ontario Institute for Studies in Education
April 1976

A GUIDE FOR USING THE EDUCATIONAL INFORMATION SYSTEM FOR ONTARIO

Every Day In Every Way

Information comes in all shapes and forms, some desirable and some undesirable. An alarm clock wakes us and a police siren stops us. Colors also give us information. Red is said to send bulls on a rampage, but it brings traffic to a halt. Numbers inform us as well, depending whether they're in the red or the black.

If we lived on a deserted island we would probably miss the varieties of information we're accustomed to. Though with the difficulty most of us have keeping up with the information that comes at us from all directions, the prospect of a deserted island has its own appeal. Nonetheless, most of us depend on information to make sense of our work as well as our private lives. And part of our skill as persons and professionals is learning to get the right information from the right places at the right times.

A doctor, for instance, knows how to identify and measure your vital signs in order to diagnose a malady. The ability to diagnose and to treat requires a good deal of information. The effective doctor considers the obvious signs of illness: appearance? appetite? elimination? body temperature? reflexes? Internal information is obtained by testing blood, urine or taking x-rays. If the elementary questions don't produce enough information, or it's contradictory, the search goes on for more specific answers. All this is done to search out the kind of information by which a diagnosis can be made. When the answers are available to the right questions, the doctor uses the information to plan a course of treatment that corrects or controls the malady.

Educators, Like Doctors

Effective educators, like doctors, ask for information in order to find out and — hopefully — apply appropriate solutions. As an educator, your question may be as straight-forward as how many ways there are to teach new math, to more complicated questions about programs for parents of emotionally disturbed preschoolers.

For answers to questions like these, you should know ERIC.

ERIC Isn't a Doctor

ERIC stands for Educational Resources Information Center. It's a library of computerized information dealing with all aspects of education.

Now if this is old-hat to you, and all you want to know is how to get information from ERIC, skip over to page 9 for directions. If ERIC is new to you, don't skip, but continue reading.

So ERIC (the Educational Resources Information Center) is a computerized library. It includes over 200,000 reports and articles on education. Among that information, material on these broad areas is available.

Career Education
Urban Education
Early Childhood Education
Education Management
Handicapped & Gifted Children
Higher Education
Information Resources
Junior Colleges
Languages & Linguistics
Reading & Communication Skills
Rural Education & Small Schools
Science, Mathematics & Environmental Education
Social Studies/Social Science Education
Teacher Education
Tests, Measurement & Evaluation

Over 2,500 new items are added each month to keep ERIC up to date. These additions are published monthly

in *Resources in Education* (1966 on) and in *Current Index to Journals in Education* (1969 on).

ERIC is operated by the National Institute of Education in the United States. But ERIC isn't entirely American. Its computers also include Canadian educational literature and information from abroad.

ERIC & EISO Go Together

Along with ERIC is EISO. EISO stands for Educational Information System for Ontario. EISO, pronounced eye-so by its friends, makes it possible for you in Ontario to use this huge ERIC library. EISO was begun in 1973 by the Ontario Ministry of Education as a service and research project. The computer terminal is in Toronto in the library of The Ontario Institute for Studies in Education.

Who Uses EISO?

EISO, or Educational Information System for Ontario, has been used by teachers, principals, students, superintendents, librarians, Educational Information Consultants and civil servants. They've used it to obtain information for reports, for theses, for public addresses and for planning and decision making.

You can use it too.

If you're still not sure EISO can get the answers to your questions — or more likely — you don't know how to ask questions of a computer, read on.

How Do You Ask A Computer Questions?

So you think EISO can provide the kind of help you could use. But how do you send questions to a computer?

There's a special librarian at EISO to help you get the information you need. Because the library is computerized, that person is called a Search Analyst. But don't let that scare you. You can write or phone or drop in to see the Search Analyst at EISO for assistance even if this is the first time you've used the service. There are also Educational Information Consultants in parts of Ontario who know how the service works and are happy to help you. But if you're on your own, this is your best guide to EISO.

You're probably familiar with the way card files in the library help you find printed material. You know about looking up information by author, title, and subject. The equivalent of the card file for using ERIC is a special dictionary called the *Thesaurus of ERIC Descriptors*. Now if pronouncing Thesaurus makes you lisp, call it the Book of ERIC Descriptors. It lists key words related to all the educational literature found in ERIC. The descriptors are in alphabetical order, and each descriptor is followed by a cluster of other terms to help you see if the computer's interpretation of the word matches your own. The clusters include Broader Terms (BT), Narrower Terms (NT), Related Terms (RT) and what the main word is used for (UF). The date the term was first added to ERIC is also indicated. Here are two examples:

REMEDIAL READING Jul. 1966
NT Corrective Reading
BT Reading
Remedial Courses
RT Reading Centers
Remedial Instruction
Remedial Reading Clinics
Remedial Reading Programs
Retarded Readers

TEACHER AIDES Jul. 1966
UF Teacher Assistants
NT Bilingual Teacher Aides
BT Paraprofessional School Personnel
RT Differentiated Staffs
Programed Tutoring
School Aides
Science Teachers
Teachers
Volunteers

There are other sections in the Thesaurus to help you pick out appropriate descriptors. The Rotated Descriptor Display splits multi-word descriptors such as Student-Teacher Ratio into single words and arranges them alphabetically.

The Search Analyst at EISO uses the *Thesaurus of ERIC Descriptors*. EISO's Educational Information Consultants have them too. You can ask the EISO Search Analyst where you can purchase one for your professional library.

EISO Search Analyst
OISE Library, Room S 218
252 Bloor Street West
Toronto, Ontario M5S 1V6
(416) 923-6641 ext. 487

Impertinent questions get impertinent answers. That's why it's important to write down your question and related personal or geographical names, test names, special terms, sponsoring bodies and any other details that can be used by the computer.

Then get in touch with the Search Analyst. Together, you can put your question in a form ERIC will understand.

A Search Warrant

Having thought about your question, and having chosen some key words, you're ready to request a search. The Request Forms are similar to the following sample. You may obtain them from the EISO office, from the Educational Information Consultants, or this sample may be copied. Even a letter will do.

The Search Analyst

The title, Search Analyst, refers to the person who conducts the actual search on the computer terminal, and isn't to be confused with the noted doctor from Vienna. Adept search analysts are worth their weight in silver, and the one at EISO is of the sterling kind.

Ideally, you'd sit down with her to discuss your question and be present as the computer responds. The next best thing is for you and the Search Analyst to have a phone conversation before the search begins, especially if this is the first time you've used the service. This can be important because putting your question to the computer is a skill of its own and the Search Analyst performs a sort of bilingual feat enabling you and the computer to communicate. If she has a clear understanding of the kind of information you do need, and of what you do not need, and of how you plan to use it, then she

EISO SEARCH REQUEST FORM

EDUCATIONAL INFORMATION SYSTEM FOR ONTARIO

1) Name: _____
Address: _____
_____
_____
_____
_____
Phone: (____)_____

2) Invoice (if payment is not enclosed):
_____
_____
_____
_____
_____

3) Search Topic: Grade level(s) — _____ Year(s) to be searched — _____
Detailed description of topic — _____
_____
_____
_____
_____

4) Reasons for requesting search (Please be specific, giving examples of how you hope to use the information) — _____
_____
_____
_____
_____
_____

5) Citations for relevant materials known to you, if any — _____
_____
_____
_____

Please mail completed search application to

EISO Search Analyst
OISE Library, Room S 218
252 Bloor Street West
Toronto, Ontario M5S 1V6

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can use her ingenuity, on your behalf, to get exactly what you want.

What Kind Of Answer Will I Get?

The answer will be in the form of a list of journal articles and documents with their abstracts. To a question you could get a list of 115 references which could well be 100 more than you want. That's why the computer responds at first only with the *number* of references. When the number of references looks manageable, the computer is then asked for actual titles and details.

How Long Does It Take?

If you've given some thought to your question before you contact the Search Analyst, the actual search on the computer will probably take less than 15 minutes. The computer gives its answers back on what's called a printout. The printout will be sent to you as quickly as the mails allow. You should allow a week.

How Much Does It Cost?

The cost of a search, in the $30-$40 range, pays for your conversation with the Search Analyst, the actual computer time and the final bibliography. This rate may change, so confirm it with the Search Analyst. If you asked three distinct questions, that would constitute three separate searches and you would be charged accordingly. You may be invoiced.

Again, What's Your Question?

It's easy to restrict your question in certain ways so you don't get swamped with a bibliography as long as your arm.

Let's say you want EISO to obtain for you information on The Use of Teacher Aides in Remedial Reading. *Teacher aides* is an obvious descriptor. That's typed into the terminal by the Search Analyst and the computer responds with the number of references to that. Say there are 851 references to it. Then you choose *remedial reading programs* as a descriptor and that's given to the computer. The reply comes back that there are 509 references. You can tell immediately that, for your purposes, both these lists are too long. And besides, you want them connected. By asking the computer to link *teacher aides* AND *remedial reading programs*, the computer would indicate there are 11 references to the combined topic. You could then request the eleven references with their abstracts.

The kind of reasoning you've just performed is called Boolean logic. We use it every day, but we rarely give it such a fancy label. The 'mind' of the computer works by Boolean logic, and it means the computer is able to link information in three ways:

1) AND
2) OR
3) NOT

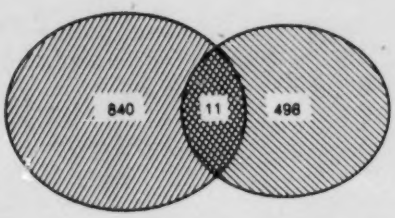
Reconsider your hypothetical question about The Use of Teacher Aides in Remedial Reading. First you asked for all the references to teacher aides. There were 851 of them. Then you asked for references to remedial reading programs and were told there were 509 of them. Because it was important that you get the relation of teacher aides to remedial reading programs, the Boolean link AND was added. You were told there were 11 references to the combined topics.

But suppose you had hoped for more than 11 references. Then the Boolean link OR can be used to make the list longer by adding a qualifying descriptor such as *paraprofessional school personnel* in order to include relevant references not indexed under *teacher aides*.

Or supposing your interest is only in the elementary school level, the computer can be asked to exclude all references to secondary schools. The Boolean link NOT can be used to exclude irrelevant references.

This ability of the computer to link and exclude information, at the press of a button, surpasses the versatility and alacrity of the most dazzling librarian you're ever likely to meet.

Here's a graphic explanation of the Boolean way of linking information:



Teacher Aides
n = 851

Remedial Reading
n = 509

Teacher Aides AND Remedial Reading
n = 11

Notice the 851 references to *teacher aides* include 11 references that also deal with *remedial reading*, and 840 that do not. Conversely, the 509 citations for *remedial reading* include the same 11 references that have both terms as descriptors, and 498 that are indexed only under the one term, *remedial reading*.

The Computer's Reply

The computer's search for material to your question takes only a few minutes. The replies come first in the number of references. When you — or the Search Analyst on your behalf — are satisfied that the number of references looks manageable, the computer is asked to give titles. Those references with their abstracts form a bibliography printed out by the computer. The printout plus an explanation is mailed to you. A partial printout is shown on the next page.

So I Have A Bibliography

So you have a bibliography printed out by the computer. You still need to get hold of the actual articles and documents you want from among that list. The titles you choose may be articles from educational journals, monographs or papers read at conferences. The printout indicates which form the material is in. If the title is preceded by EJ and a number, for instance EJ 090 471, you know it's a journal article. If the title begins with ED and a number, that signifies a report or document. The ED is derived from educational document whereas EJ refers to educational journal. But an explanation accompanying your printout will explain all that to you. Your nearest university or public library may have the material you want. If not, it may be ordered in the following formats:

1) microfiche of documents
2) photo copies of journal articles
3) papercopies of documents made from microfiche

Before ordering, ask yourself these questions:

1) Do I have access to a microfiche reader?
2) How quickly do I need the material?
3) How do I plan to use it?
4) How much does it cost?

The Use of Teacher Aides in Remedial Reading

Partial Printout

Journal Reference

ERIC ACCESSION NUMBER	EJ096471
CLEARINGHOUSE ACC. NO.	AA517272
AUTHOR	TIMMONS, JUDITH
TITLE	USING PARAPROFESSIONALS IN THE ELEMENTARY SCHOOL READING PROGRAM
PUBLICATION DATE	DEC 73
SOURCE	KAPPA DELTA PI RECORD; 10; 2; 57
DESCRIPTORS	*ELEMENTARY SCHOOLS
DESCRIPTORS	*PARAPROFESSIONAL SCHOOL PERSONNEL
DESCRIPTORS	*TEACHER AIDES
DESCRIPTORS	*READING PROGRAMS
DESCRIPTORS	*PERSONNEL SELECTION
DESCRIPTORS	INDIVIDUALIZED PROGRAMS
DESCRIPTORS	REMEDIAL READING PROGRAMS

Document Reference

ERIC ACCESSION NUMBER	ED037579
CLEARINGHOUSE ACC. NO.	EC005441
TITLE	PROJECT FOR PREPARING TEACHER AIDES TO FACILITATE A TUTORIAL READING PROGRAM WITH EMPHASIS ON PERCEPTUAL TRAINING FOR PRIMARY SCHOOL AGE CHILDREN OF LOW SOCIOECONOMIC STATUS. FINAL REPORT.
PUBLICATION DATE	FEB 70
ISSUE	RIE70AUG
INSTITUTIONAL NAME	VIGO COUNTY SCHOOL CORP., TERRE HAUTE, IND.
EDRS PRICE	EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTIVE NOTE	23P.
DESCRIPTORS	*DISADVANTAGED YOUTH
DESCRIPTORS	*EXCEPTIONAL CHILD EDUCATION
DESCRIPTORS	PERCEPTUAL MOTOR LEARNING
DESCRIPTORS	PRIMARY EDUCATION
DESCRIPTORS	PROGRAM GUIDES
DESCRIPTORS	*REMEDIAL READING PROGRAMS
DESCRIPTORS	*TEACHER AIDES
DESCRIPTORS	*TUTORIAL PROGRAMS
ABSTRACT	DESCRIBED IS A TRAINING PROGRAM TO PREPARE TEACHER AIDES TO TUTOR IN A REMEDIAL READING PROGRAM FOR CHILDREN OF LOW SOCIOECONOMIC STATUS. INSTRUCTION EMPHASIZED EARLY CHILDHOOD GROWTH AND DEVELOPMENT, VISUAL MOTOR PERCEPTION TRAINING, LANGUAGE AND AUDITORY DEVELOPMENT, AND EMOTIONAL AND SOCIAL DEVELOPMENT. TRAINEE SELECTION, THE TRAINING PROGRAM, ITS USE IN THE REGULAR SCHOOL PROGRAM, AN EVALUATION OF THE PROJECT, AND RECOMMENDATIONS ARE DISCUSSED. THE COURSE CURRICULUM, WITH SUGGESTED TEACHING TECHNIQUES, MATERIALS, AND APPROACHES TO CLASSROOM MANAGEMENT, IS INCLUDED. (JM)

8

Ordering Microfiches

The word microfiche is pronounced 'micro-feesh'. In case you've never used a microfiche, it's a celluloid card about 4 by 6 inches in size on which a great deal of printed copy appears in miniature. When placed in a machine called a microfiche reader, the condensed copy is enlarged on a screen for easy reading. An average report can be condensed on 1 to 3 of these cards since one card includes up to 96 pages of text. Ordering microfiches, of course, assumes you have access to a microfiche reader. Your library may have one. Each microfiche from EISO costs 35c. Based on the information in your printout, order microfiches from:

EISO Search Service
OISE Library, Room S 218
252 Bloor Street West
Toronto, Ontario M5S 1V6
(416) 923-6641 ext. 487

The microfiches will come to you promptly in the mail.

Ordering Photocopies

Photocopies of journal articles may be ordered at a price of 10c per page from EISO.

Ordering Paper Copies of Documents

Paper copies, sometimes called hard copies, are distinct from ordinary photocopies in that they're made from microfiche originals. This service takes more time and costs more than ordering microfiches from EISO. It's offered by EDRS in the United States. Their address is:

ERIC Document Reproduction Service
P.O. Box 190
Arlington, Virginia 22210
(703) 841-1212

The cost must be pre-paid in American funds.

It's In Your Hands

The material comes to you in the form you requested. EISO and ERIC have done their part in obtaining the educational information you asked for. It's now in your hands.

Complaint Department

EISO (that's Educational Information System for Ontario) can do remarkable things for you. It can obtain for you valuable and hard-to-find information inexpensively and at impressive speeds. It cannot, however, answer all your educational questions, but then you didn't really expect it would. Vague questions inevitably get vague answers. If your question isn't the sort ERIC can answer, you'll be told so. There may be other ways of answering your question and the people at EISO are committed to helping you.

If you have a complaint, don't grumble about it to yourself, get in touch with the Search Analyst about it. The buck stops there.

EISO Search Analyst
OISE Library, Room S 218
252 Bloor Street West
Toronto, Ontario M5S 1V6
(416) 923-6641 ext. 487

STEPS IN CONDUCTING A SEARCH

1. WRITE OUT YOUR QUESTION.
2. GET HOLD OF A *THESAURUS OF ERIC DESCRIPTORS*, IF POSSIBLE.
3. CHOOSE DESCRIPTORS AND KEY WORDS.
4. SEND IN YOUR SEARCH REQUEST TO THE EISO SEARCH SERVICE.
5. RECEIVE PRINTOUT WITH REFERENCES AND ABSTRACTS.
6. ORDER THE ARTICLES AND DOCUMENTS YOU WANT.
7. MAKE USE OF THE INFORMATION. GOOD LUCK!

A list of explanations of abstruse, arcane, dialectal and technical terms known as a

GLOSSARY

Abstract
- an informative, short summary of the subject and contents of a reference.

Access points
- the key words and phrases that set the computer 'thinking'. They include subject terms, test names, authors and descriptors.

Boolean logic
- two ideas may occur individually (OR), or must occur together (AND), or must not occur together (NOT). Organizing relationships between data in this fashion is Boolean logic. Computerized searching of ERIC operates in this way.

Broader Term (BT)
- part of the notes of each descriptor in the Thesaurus referring to a subject heading that's more general than another heading. For example, *reading* is a broader term than *remedial reading*.

CIJE
- initials for *Current Index to Journals in Education*, an index to current educational journal articles, published monthly by ERIC.

Citations
- the references that may be retrieved on a particular topic.

Clearinghouse
- centres where current educational material is indexed and abstracted on its way to the ERIC data base. Additions are published monthly in CIJE and RIE. Of over a dozen clearinghouses, one example is the ERIC Clearinghouse on Early Childhood Education.

Client
- you, as user of EISO services.

Data base
- all the information stored in a computer. It's also called a data bank and can refer to either numerical or bibliographical data.

Descriptor
- a term that upon being sent to the computer will elicit all the references to it. The approved terms for ERIC's data base are found in the *Thesaurus of ERIC Descriptors*.

ED number
- the accession number for ERIC documents. It identifies a document in the computer. These numbers appear in the *Resources in Education* index and on the computer printout.

EDRS
- the ERIC Document Reproduction Service where paper copies of material on microfiches can be ordered.

EIC
- resource persons in various parts of Ontario acting as Educational Information Consultants. They have special knowledge of how EISO works.

EISO
- the Educational Information System for Ontario, providing access to computerized information about all aspects of education.

EJ number
- the accession number identifying a journal reference in the computer. It appears in the *Current Index to Journals in Education* and on the computer printout.

ERIC
- the Educational Resources Information Center in the USA. It produces the indexes known as RIE and CIJE as well as the magnetic tapes that make up the ERIC data base.

Hard copy
- also known as paper copies. They are made from microfiche originals.

Hits
- the number of useful references retrieved by the computer search.

Identifiers
- subject terms, proper nouns, including personal, geographical or test names used like descriptors, but not yet on the approved list in the *Thesaurus of ERIC Descriptors*.

Microfiches
- celluloid cards on which up to 96 pages of ordinary type can be miniaturized. A microfiche reader is required to make use of them.

Microfiche reader
- a machine that enlarges a microfiche and projects it on a ground glass screen for easy reading.

Misses
- the number of potentially useful references in the computer *not* retrieved.

Narrower Term (NT)
- part of the notes for each descriptor found in the Thesaurus referring to a subject heading that's more specific than another heading. For example, *remedial reading* is a narrower term than *reading*.

Off-line
- the printing of references retrieved by a search at the location of the computer rather than on the Search Analyst's terminal.

OISE
- The Ontario Institute for Studies in Education in Toronto, Ontario, where EISO is located.

On-line
- the direct communication between the Search Analyst's terminal and the main computer.

Printout
- the computer's reply. It's a list or bibliography of references with details about each title.

Reference
- a unit of information on any particular topic. Also called a citation.

RIE
- *Resources in Education*, an index published monthly by ERIC on current educational documents and reports.

Related Term (RT)
- part of the notes for each descriptor found in the Thesaurus indicating one term is similar to another, though neither broader nor narrower.

Relevance
- the appropriateness of a computer reference compared to what you requested.

Rotated Descriptor Display
- a section in the *Thesaurus of ERIC Descriptors* in which each descriptor is listed in alphabetical order according to each of the words in the term. For example, *remedial reading* would appear under both *remedial* and *reading*.

Scope notes
- explanations of the way ambiguous terms are used in ERIC.

Search
- the process of requesting information from the computer.

Search Analyst
- the person who's experienced in using the computer search system, answering questions about education, and obtaining for you the information you want.

Terminal
- a specialized 'typewriter' that uses the telephone to link the search analyst with the computer.

Thesaurus of ERIC Descriptors
- a special dictionary of words and terms, specially compiled to be used with ERIC's data base.

Used For (UF)
- the Thesaurus abbreviation for synonymns indicating what term is used for indexing materials on a given topic.

APPENDIX N:

EDUCATIONAL INFORMATION SYSTEM FOR ONTARIO

Interview Schedule for ERIC Survey

1. Institution: _____

_____

2. Phone number: _____

3. Person contacted: _____

4. Position: _____

5. Is ERIC collection complete? _____

If not, how many fiche? _____

what topics? _____

_____

_____

_____

What level of demand is there? _____

_____

6. Do you supply on-line bibliographic searches? _____

To whom? _____

_____

_____

What price? _____

What is your volume? _____

_____

7. If not, do you refer others to search services in your area? _____

8. Do you supply fiche copies of ERIC fiche? _____

   What is your volume? _____

9. Do you supply paper copies of fiche? _____

   If no, are reader-printers available? _____

10. Comments: _____

APPENDIX O:

Institutions and Individuals Contacted in Survey of ~~Search Services Searching~~ ERIC

Alberta Dept. of Education

Alberta Education Library,
705 Executive Building,
10105 - 109 Street,
Edmonton, Alberta T5J 2V2

(403) 427-2985

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Brandon University

Education Library,
Brandon, Manitoba, R7A 6A9

(204) 728-9520

Mr. Terry Mitchell, Education Librarian

Calgary Board of Education

Professional Library,
307 - 55th Ave. S. W.,
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Halifax, Nova Scotia.

(902) 424-3601

Ms. Janet McNeil, Reference Librarian

Dalhousie University

Mc Donald Science Library,
Halifax, Nova Scotia.

Mr. Frederick Kennedy, Librarian.

McGill University

Education Library,
Montreal, Quebec.

(514) 392-8849

Miss Elizabeth Minnie, Reference Librarian

McGill University

Medical Library,
3655 Drummond,
Montreal, Quebec.

(514) 392-4339

Maureen Wong, Computer Librarian-Reference

Memorial University

Library,
St. John's, Newfoundland.

(709) 753-1226

Mr. Marshall Clinton, Head Information Services

Mount Allison University

Main Library,
Sackville, New Brunswick.

(506) 536-2046

Miss Eleanor Magee, Head Librarian

Nova Scotia Teachers' College

Library,
Truro, Nova Scotia

(902) 895-5347

Mr. Paul Tiwana, Acquisition Librarian

09227

The Ontario Institute for Studies in Education

252 Bloor Street, W.,
Toronto, Ontario, M5S 1V6

(416) 923-6641

Miss Jan Schmidt, Public Services Librarian

Ms. Ruth von Fuchs, EISO Search Analyst

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Halifax, Nova Scotia.

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Mr. Murray Baillie, Reference Librarian

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Bibliothèque Général,
Québec, P. Q.

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Montrèal, Québec.

(514) 343-2742

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Bibliothèque Générale,
Sherbrooke, Québec,

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Mr. Patrick Shanks, Head of Reference

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Ms. Lydia Friesen, Reference

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Robarts Library,
Toronto, Ontario.

(416) 978-6215

Mrs. Sheppard, Search Editor

York University

Steacie Science Library,
4700 Keele Street,
Toronto, Ontario

(416) 667-3927

Mr. Brian Wilks, Science Librarian

C0220

THE PENNSYLVANIA EDUCATIONAL INFORMATION NETWORK:

In an effort to make R.I.S.E. responsive information services available to all educators in the Commonwealth, a state-wide network has been established. Two-thirds of the Commonwealth's 29 Intermediate Units have a staff member trained by R.I.S.E. in the role of a Resource Utilization Specialist (RUS). The RUS functions as an intermediary between the local district personnel and information services available from R.I.S.E. Ideally, the network will operate a two-way mode: (a) R.I.S.E. will acquire information from all elements of the educational system in the Commonwealth; (b) R.I.S.E. will provide responsive information to local districts and other agencies through the network. A secondary function of the network will be to provide an additional avenue for informal needs assessment activities at local, regional, and state levels. Future developments may include an expansion of the network to facilitate management information flow and other related systems. Local districts in non-participating Intermediate Units, as well as out-of-state agencies, may contract directly with R.I.S.E. for services.

PARTICIPATING INTERMEDIATE UNITS

Intermediate Unit One	Capital Area
Allegheny	Central Susquehanna
Midwestern	Luzerne
Northwest Tri-County	Colonial Northampton
Westmoreland	Carbon-Lehigh
Appalachia	Bucks Co.
Seneca Highlands	Montgomery Co.
Central	Chester Co.
Tuscarora	Delaware Co.
Lincoln	Beaver Valley
Lancaster-Lebanon	ARIN
Berks Co.	Schuylkill

R.I.S.E. is a service agency of the Montgomery County Intermediate Unit funded with state and federal resources serving education in the Commonwealth of Pennsylvania.

The work presented or reported herein was performed pursuant to one or more grants from the state or federal government. However, the opinions expressed herein do not necessarily reflect the position or policy of the funding agency and no official endorsement by the funding agency should be inferred.

198 Allendale Road
King of Prussia, Pa. 19406
(215) 265-6056

Revised 9/1/74

REQUESTING SERVICE

Schools in participating Intermediate Units should place their request through the Resource Utilization Specialist in their respective Intermediate Unit. Montgomery County I.U. educators should call or write Mrs. Emma Peterson at R.I.S.E. Please indicate your choice and enclose payment (if outside client) when ordering materials.

Outside clients are those who are not K-12 educators in participating Intermediate Units (examples–clients from higher education, educators in non-participating intermediate Units, clients from other states.)

The options for obtaining search materials are as follows:

Duplicate search – Client receives complete duplicate of search package.
Outside clients will be charged $25.00 ($35.00 out-of-state) or ten cents a page whichever is greater.

Selective Response – Client receives ten articles which he chooses from the search bibliography. Outside clients should remit $12.50 ($10.00 for the selective response and $2.50 for the bibliography.)

Bibliographies – Client receives the search bibliography. Outside clients pay $2.50 per bibliography.

DIALOG Bibliographies (computer) – Client receives maximum 100 journal or ERIC citations for fee of $25.00.

(Prices are subject to change at any time. Contact R.I.S.E. for current policy on costs and services.)

R.I.S.E. STAFF:

Project Director – Richard R. Brickley
Assistant Project Director – Carolyn V. Trohoski
Librarian – June Katucki
Information Specialist – Emma Peterson
Executive Assistant – Lalla A. Krauss
Authorized Agent and Grantee – Dennis Harken, Executive Director, Montgomery County Intermediate Unit

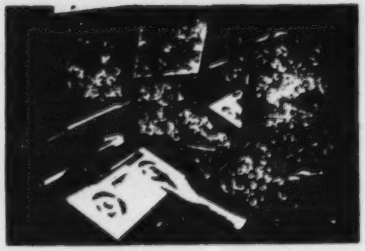
Pennsylvania Department of Education
Advisors –
- Donald M. Carroll, Jr., Commissioner, Office of Basic Education
- John L. Kennedy, Director, Bureau of Planning and Evaluation

R I S E

RESEARCH AND INFORMATION SERVICES FOR EDUCATION
198 Allendale Road, King of Prussia, Pa. 19406 (215) 265-6056

WHAT IS R.I.S.E.?

Project R.I.S.E. is essntially an educational information center devoted to providing educational decision-makers with relevant information drawn from national, state, regional, and local resources in support of their problems and concerns. The project operates under the joint sponsorship of the Montgomery County Intermediate Unit and Bureau of Planning and Evaluation of the Pennsylvania Department of Education. It is currently operating a statewide educational information network.



R.I.S.E. INFORMATION RESOURCES

Pennsylvania Title III program reports
Educational Resources Information Center (ERIC)
Current Index to Journals in Education (CIJE)
300 current educational journals
Selected Curriculum Materials
Products of the Regional Educational Labs
National indexing services
UNIPACs
ERIC Clearinghouses
Xerox Curriculum Materials Clearinghouse

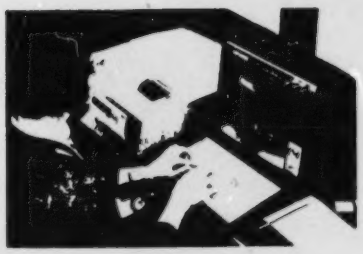
Cooperative agreements with other informational agencies such as Educational Testing Service and Educational Research Service

R.I.S.E. LITERATURE SEARCH:

Perhaps the most important – and certainly the most visible – service is the preparation and dissemination of research information reports, that is, the end product of a literature search. Each search and each resulting report is individually tailored to the specific question asked by a specific client on a specific topic. It is thus in every sense a responsive service, geared to the client's needs. Trained searchers receive a search request, negotiate with the client to precisely define his requirements, and then undertake a search of all available resources to locate and retrieve material bearing directly on the question at issue. The result is a package of knowledge in the form of article or book print-outs, bibliographies, abstracts and other material. Searches may deal with, for instance, the structure of the middle school or the ungraded school or school student activism; the task is to come up with pertinent and reliable data concerning any question asked about any legitimate educational concern. The search process can be either manual or computer or both. Other forms of information dissemination include ready reference, selected dissemination packages, and duplicates of original searches. R.I.S.E. prefers to provide its products in microfiche format but hard copy is available at higher cost.

SERVICES:

- Preparation and dissemination of research information reports (reviews of literature)
- Ready reference services
- Training and dissemination activities and information services
- Publication program including occasional papers, bibliographies, special reports and state-of-the-art papers on specific topics
- Computer and manual information retrieval from such national resources as the ERIC collection
- Dissemination of ESEA Title III activities
- Dissemination of promising educational practices
- Diffusion of national and state validated programs
- Dissemination of selected curriculum materials such as learning packets



COMPUTER DATA BASES

Through the Lockheed computer system, DIALOG, R.I.S.E. has access to a number of educational data bases on-line. They are as follows:

ERIC – (RIE 1965–present) (CIJE 1969–present)
ERIC-EC (Exceptional Children) (1965–present)
AIM-ARM – (Vocational-Technical Education documents) (1965–present)
Psychological Abstracts (1967–present)
Social Science Citation Index (1972–present)

Other data bases in engineering, agriculture, economics, business and the sciences are also available though not as widely used. Any or all of the data files may be searched to locate relevant material for a R.I.S.E. search.

TITLE III FACILITATOR PROJECT

R.I.S.E. has been named Pennsylvania's facilitator for the new Title III thrust in the educational areas. R.I.S.E. is cooperating with the Title III Office of the Pennsylvania Department of Education and USOE Title III Division of Plans and Supplementary Centers in this effort.

The role of R.I.S.E. will be assisting districts in identifying needs and matching those needs with a pool of appropriate solutions from national and state resources. The linking concept beginning with the dissemination of information at the interest and awareness levels will be extended into the diffusion or implementation levels. In essence, R.I.S.E. will be providing technical assistance to districts to aid them in adapting or adopting the need-matched identified programs.

APPENDIX Q: San Mateo County Education Resources Center (SMERC). Resource Guide.

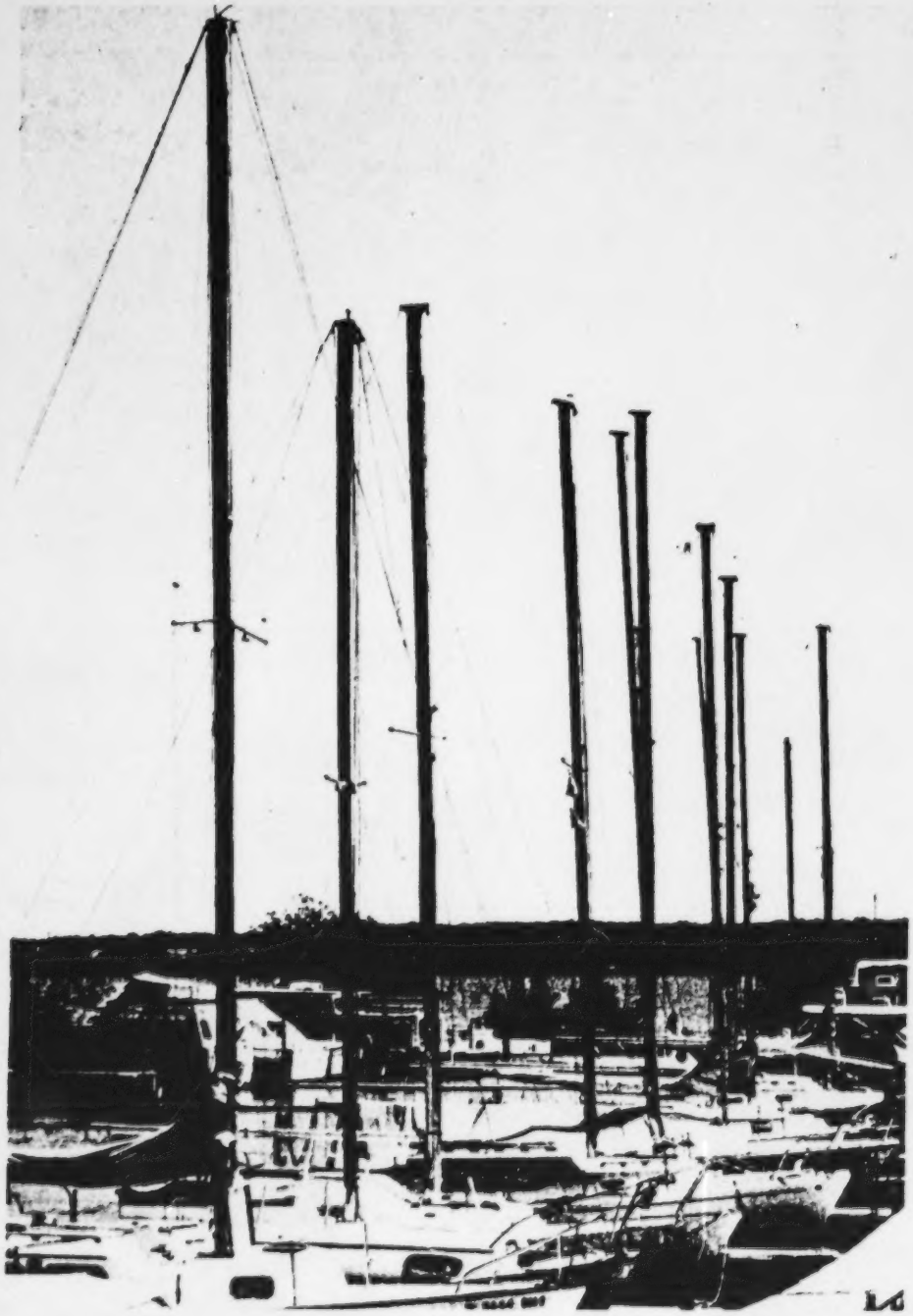
SAN MATEO COUNTY OFFICE OF EDUCATION

SM ERC

RESOURCE GUIDE

from the world of EDUCATION

EDUCATION RESOURCES CENTER
333 MAIN STREET
REDWOOD CITY, CALIFORNIA 94063
415 364-5600



California

Curriculum Guides

1975

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INTRODUCTION

The collection and dissemination of curriculum guides has been a concern of California educators for many years. It has always been difficult to obtain copies of the guides, and, after collection, the physical task of providing copies to interested parties has been virtually impossible. Because of these problems, the guides have not always been available.

The San Mateo County Educational Resources Center (SMERC) offered its services to the County Superintendents of Schools as a collection and dissemination agency. It was the intent to provide a yearly catalogue listing all of those guides submitted by county and local educational agencies. This is the second volume of the Curriculum Guide series. The first volume, the 1974 edition published in January, 1975, is still available from our office at a cost of $3.50.

The Curriculum Guide Catalogue is not intended as an evaluation aid. Its purpose is to provide a state-wide awareness of curriculum guides produced during the year. The Catalogue has three sections: A Subject Index, an Institution Index, and a Summary Section. All guides are originally listed in the Catalogue by a "CM" identification number. This "call" number is the one to be used in requesting a specific guide. All documents cited in this Catalogue are housed by SMERC in MICROFICHE FORMAT.

The Subject Index lists all documents by subject areas. The Subject Index will enable you to locate the documents that are of interest to you. If you want to know what guides have been developed by a certain district or school, check under its name in the Institution Index. If you are uncertain as to the document content, check under its title in the Summary Section. A brief description of the document follows.

F. Curtis May,
Director of Library Services

Frank W. Mattas,
Administrative Director

SAN MATEO COUNTY BOARD OF EDUCATION

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Officer and Secretary

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1975

SAN MATEO COUNTY

EDUCATIONAL RESOURCES CENTER

SMERC provides information service to all educators in San Mateo County and to its participating member groups. Its resources include ERIC (Educational Resources Information Center), FIDO (Fugitive Information Data Organizer), the Professional Curriculum Library, and many specialized collections.

All collections emphasize new publications in emerging fields of education including new books concerning various disciplines in a broad range of subjects; curriculum guides, policy handbooks, and other national, state and local publications; more than 700 periodicals and newsletters regularly published by educational organizations and related agencies; and, directories and pamphlets published by the Office of Education.

Access to the storehouse of educational research and resources is provided to all San Mateo County teachers and also, through contract, to teachers and administrators outside of San Mateo County. Expert researchers probe the computerized files of ERIC and FIDO upon request of its subscribers. Information packets of microfiched documents, photocopies of journal articles, and bibliographies of abstracted documents are supplied to clients.

CURRICULUM MATERIALS DEPOSITORY

School Districts and County Offices in California are encouraged to participate in the Curriculum Materials Depository. In order that materials prepared by all districts may be made available to all interested persons, you are encouraged to send any curriculum materials produced since June, 1974 to the address below.

When sending materials, we ask the following:

1. Send original copies or good printed copies. We cannot photograph from poorly printed script, ditto copies, etc.

2. Please send two copies of each document if at all possible. One copy should be bound in the usual fashion and one copy unbound.

3. Please note on the title page the availability of the original document from you, i.e., the price if for sale, the address to which a person should write, or the fact that printed copies are not available.

4. Send the documents as soon as produced on a year-round basis to:

EDUCATIONAL RESOURCES CENTER
Curriculum Materials Depository
San Mateo County Office of Education
333 Main Street
Redwood City, CA 94063

09238

ORDERING INSTRUCTIONS

Any educator may request microfiche reproduction of the curriculum guides. A charge of 50¢ per microfiche card will be made, and all microfiche materials are the permanent possession of the client. To determine the number of cards for any specific document: note the number of pages in each document, estimating 46 pages on the first microfiche card, and up to 60 pages on each additional card.

Standing orders are offered to any institution at a cost of 35¢ per microfiche card. Institutions wishing the complete collection may order at the following prices:

1974 volume, 418 titles - $550
1975 volume, 296 titles - $450

Please note that complete collection orders are subject to a delay of 60 days. Current microfiche will be sent quarterly for standing orders with the appropriate billing. The Curriculum Guide Catalogues, including this second volume, are available at a charge of $3.50 each. The Catalogues are furnished free as a regular resource guide to subscribing agencies.

APPENDIX R: San Mateo County Education Resources Center (SMERC). Handbook for Linking Agents.

A HANDBOOK FOR LINKING AGENTS

- Personnel
- Resources
- Services
- Publications
- Policies

and more.....

AN INTRODUCTION TO SMERC

This handbook is a compilation of miscellaneous information about SMERC--its people, its policies and resources, its publications and jargon. It is designed as a reference which will help you in dealing with your clients--and in dealing with SMERC.

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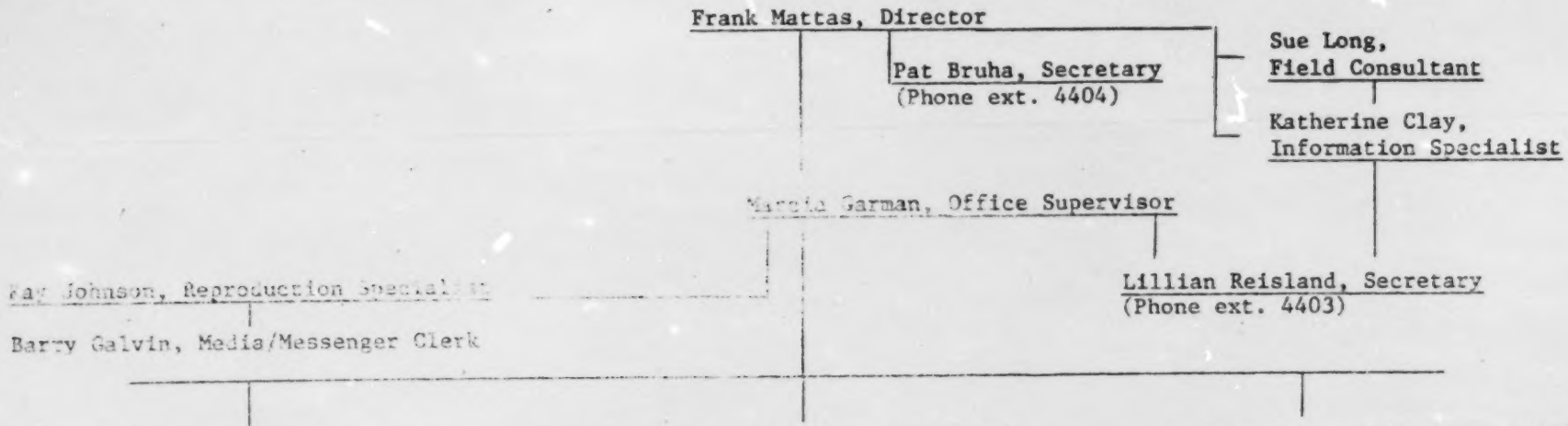
SMERC ORGANIZATION CHART (ABBREVIATED)

(Phone: (415) 364-5600)



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Lois Casey
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ORANGE COUNTY
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OREGON (PORTLAND)
Jean Seay
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Ralph Humphrey
(503) 776-5510

PLACER COUNTY
Dr. Martin Bauman
(916) 823-4611

RIVERSIDE COUNTY
Dr. Adrian Gentry/B. Fairchild
(714) 787-6550

SACRAMENTO (FOLSOM-CORDOVA DISTRICT)
Floyd Andrus
(916) 985-4483

SACRAMENTO CITY UNIFIED
Ted Porter
(916) 454-8561

SACRAMENTO (SAN JUAN UNIFIED)
Ray Dimond
(916) 484-2541

SANTA BARBARA COUNTY
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(805) 964-4711 x 247

SANTA CLARA COUNTY OFFICE
Susan Choi
(408) 299-4096

SANTA CLARA (MORGAN HILL UNIFIED)
Gordon Logan
(408) 779-5272

SANTA CLARA (MT. VIEW/LOS ALTOS DISTRICT)
Milton L. Schmidt
(415) 968-6571 x 40

SANTA CLARA (OAK GROVE DISTRICT)
D. James Hastings
(408) 227-8300 x 156

SANTA CLARA (LOS GATOS JT. UHSD)
Paul Collins
(408) 354-2520

SANTA CLARA (EVERGREEN DISTRICT)
Margaret Ceresa
(408) 274-2520

SANTA CLARA (GILROY DISTRICT)
Mrs. Frances Trettin
(408) 842-8285

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(415) 364-5600 x 4405

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Peter Kalamaras
(707) 429-6531

SONOMA COUNTY
Ctesylla Blackwill
(707) 527-2143

TULARE COUNTY
Sabin Gray
(209) 733-6434

TUOLUMNE COUNTY
Kathy Anderson
(209) 532-1419

YOLO COUNTY
Mrs. Shipley Walters
(916) 666-8421

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COSMOS has nothing to do with metaphysics; it is just another acronym standing for County of San Mateo Online System, a computerized information retrieval system designed specifically for SMERC by Digital Equipment Corporation.

The computer teminal, whether it be attached directly to a communications port or via dia-in telephone lines, will be communicating with a Digital Equipment Corporation DECsystem-1080 Computer System. It is the largest computer that DEC produces, and is located at the County Office of Education in Redwood City, California.

The ERIC portion of the data base was purchased by San Mateo County from ERIC headquarters in the form of magnetic tapes. Upon receipt of these tapes, programs were devised to load their contents onto disk in a retrievable and logical format.

SMERC's fugitive, or non-ERIC, files which have not previously been computerized, were loaded into the same data base as their big brother ERIC and are now searchable by computer. Included in the non-ERIC portion of the COSMOS data base are six of SMERC's special document collections, each of which has its own unique "call" letters:

ID = FIDO - All Topics
CM = Curriculum Materials
UN = UNIPACS - Individualized Programs
SC = Learning Centers - Individualized Topics
PR = PERI Documents - Administrative Topics
CE = Career Education Documents

In addition to COSMOS processing, the DECsystem-1080 will while away its idle moments monitoring students, payroll records, and performing other County tasks.

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SMERC Data Files

NAME	ORIGINATOR	SCOPE AND/OR CONTENTS	COMPUTERIZED?	KEPT CURRENT?	SIZE	CATALOGS AVAILABLE FROM SMERC?	LETTER CODE FOR DOCUMENT #	FORMAT
ERIC RIE (Resources in Education)	Nat'l Instit. of Education	Research, Reports, Curric., etc. on all aspects of education	yes/DIALOG and COSMOS	yes	about 120,000 documents	no/Gov't Printing Office	ED	mf
ERIC CIJE (Current Index to Journals in Education)	"	Indexes over 700 educational journals, mainly USA	yes/DIALOG and COSMOS	yes	about 130,000	no/Macmillan Information, Inc.	EJ	pc
FIDO (Fugitive Information Data Organizer)	SMERC	All ed. issues of interest to our clients. Also locally developed materials	yes/COSMOS selectively	yes	about 5,000	yes	ID	mf if over 5pp. PC if less
CURRICULUM MATERIALS	SMERC, as state curric. depository	Curric. Guides, lesson plans, syllabi, handbooks, etc., developed by CA schools	yes/COSMOS	yes	about 1,000	yes	CM	mf
UNIPACS	Kettering Foundation	Individualized student lessons, all subjects K-12	yes/COSMOS selectively	no	about 4,000	no/individual UNIPACs indexed in COSMOS	UN	mf
LEARNING CENTERS	Santa Clara County	Instructions for setting up classroom learning centers on specific topics. All subjects, mainly K-8	yes/COSMOS selectively	no	about 600	no/individual learning center indexed in COSMOS	SC	mf
CAREER ED MICROFICHE COLLECTION	SMERC, for Calif. State Dept. of Ed.	Career education lessons, mainly student awareness K-Jr. College	yes/COSMOS selectively	no	about 500	yes/ID 004 715	CE	mf
EDUCATION INDEX	H. W. Wilson	Index to over 200 educational journals	no	yes	unknown	no/H.W. Wilson	none	pc
SAN MATEO COUNTY CURRICULUM LIBRARY	S.M. County	Current library collection on education and teaching. Sample curriculum and texts	no	yes	about 25,000 volumes; about 1,000 journal subscriptions	no	none	on loan to County school personnel

ERIC - Educational Resources Information Center

ERIC, a nationwide educational information network, acquires, selects, abstracts, indexes, stores, retrieves, and disseminates significant and timely educational materials. ERIC's central facility is in Washington, D.C.; the sixteen clearinghouses, each specializing in a specific subject area, are located throughout the United States. The abstracts of educational materials selected for the ERIC collection appear monthly in two ERIC catalogs, RIE and CIJE.

RIE - Resources in Education ("ED")

RIE is prepared monthly by ERIC and is published by the U.S. Government Printing Office. The catalogs contain subject, author, and institution indexes as well as document resumes which describe the contents of the document. The subject index is based on the educational terminology accepted by ERIC and listed in the Thesaurus of ERIC Descriptors.

CIJE - Current Index to Journals in Education ("EJ")

CIJE, also prepared monthly by ERIC but published by McMillan Information, is designed to provide coverage of the vast amount of literature published in educational journals. ERIC has identified approximately 700 publications representing the core periodical literature for the field of education. The journal article citations contain bibliographic data but, unlike RIE citations, contain little more than a one-line annotation. Like documents in RIE, the Thesaurus is used for assigning descriptive terms to each article.

FIDO - Fugitive Information Data Organizer ("ID")

FIDO is SMERC's own collection of documents which have been determined to be of interest to educators, but which are not found in any other known collection of educational materials. Identified as "fugitive" materials, the microfiche documents are indexed and abstracted in the same manner as those found in ERIC publications; the Thesaurus provides the educational terminology for abstracting, indexing and searching FIDO. FIDO enables SMERC to have on hand locally significant educational literature which may not appear in the ERIC collection. The FIDO catalog consists of subject, author, and institution indexes along with a summary section describing each document.

LEARNING CENTER PACKAGES ("SC")

A Learning Center is a program designed by the teacher to provide for the different learning patterns of students, to lead them to assume the responsibility of solving problems through exploration, and to offer the opportunity for success at the learner's level of

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achievement. The Learning Centers or Stations are designated areas within the classroom where children may go to explore an activity related to some new concept or reinforce a particularly difficult class-related skill.

Each learning center has a suggested grade level in parenthesis following the title. General grade levels are indicated by PR (primary), EL (elementary), IN (intermediate), or HS (high school). The majority of the packages are for K-8. They do not contain objectives.

UNIPACS ("UN")

Unipacs are individualized program packages which include a single concept, instructional objectives, pre- and post-tests and diversified learning strategies. Unipacs include:

1. A major goal and its component ideas, skills, or attitudes
2. Learning objectives stated in behavioral terms which contain expected performance, conditions, limitations and expected proficiency levels
3. Suggested instruction strategy
4. Identification of learners
5. Materials and equipment needed to reach the goal (often a specific textbook)
6. Suggested follow-up instructional opportunities
7. Example tests (both pre and post) with answer keys
8. Evaluation forms

Unipacs are indexed under general grade levels: primary, elementary, junior high, secondary.

CURRICULUM MATERIALS ("CM")

The California Curriculum Guide collection is designed to provide a state-wide awareness of curriculum guides produced by the various school districts in the State of California only. These guides are abstracted and indexed by the SMERC staff, using the Thesaurus of ERIC Descriptors, are available in microfiche format, and are computer retrievable through COSMOS.

CAREER EDUCATION/CAREER AWARENESS MATERIALS ("CE")

Career education/career awareness materials were collected by the California State Department of Education. A catalog of these materials was prepared by SMERC; it includes titles of curriculum,

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instruction, guidance, and management materials for career education. The documents are available in microfiche format, as is the catalog itself: order #ID 004 715.

PROFESSIONAL LIBRARY

The San Mateo County Office of Education library houses a solid collection of professional books and a basic reference collection, plus most of the journals cited in Education Index and CIJE. Though circulated only to San Mateo County educators, these materials are often used by the SMERC research staff as reference materials for other subscribing agencies.

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TYPES OF SEARCHES

QUICK IDENTIFICATION SEARCH

If you have access to SMERC newsletters, SMERC resource guides, FIDO and/or ERIC catalogs, you may want to locate your own material, and simply phone your linking agent to give him the identification numbers of the document you want. The turn around time is 24 hours from the time we receive the request. There is no charge for this service unless the request exceeds the maximum allowed. (See CHARGES)

COMPUTER PRINTOUTS

We can also provide you with a computer printout of ERIC document citations in a given subject area. When you receive the printout, you can then analyze the results yourself and request needed documents by identification numbers. The turn around time is 10 days from the time we receive the request. There is no charge for a negotiated computer printout; the only charge would be if the request for reproduction exceeded the maximum allowed per search. (See CHARGES)

IN-DEPTH SEARCHES

If you require research on a given topic, and want the search prepared, conducted, analyzed, and reproduced by our staff, the in-depth search is perhaps best. The turn around time is 14 days from the time we receive the request. There is no charge for this service.

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POLICIES AND CHARGES

FOR SUBSCRIBING AGENCIES

1. 10 free microfiche cards with each client-initiated request. Each additional microfiche card is 35¢, or 3 for $1.00.

2. 20 free pages of photocopy with each client-initiated request. Each additional page is 15¢.

3. 20 free pages of hardcopy (printout of microfiche) with each client-initiated request. Each additional page is 25¢ with a limit of 50 pages (including the 20 free) per search. Larger orders must be approved by the Research Supervisor and will have special handling charges. These are a $2.50 per hour charge for reproduction time and 35¢ per page over the initial 50. All orders may be subject to a 4-week delivery period. (To aid clients in minimizing costs, SMERC can supply the order form to secure hardcopy materials from the ERIC Document Reproduction Service, which is able to provide hardcopy at lower costs.)

4. Computer Searches

   a. A maximum of 50 free abstracted citations per search request--15¢ for each additional abstract.

   b. A maximum of 50 free citations without abstracts per search request--10¢ for each additional citation.

   c. Identification number/title citations limited to 150 unless approved by the Research Supervisor.

5. $2.00 per copy (while the supply lasts) for extra FIDO catalogs or Resource Guides.

RESOURCE BANKS AVAILABLE FOR PURCHASE

Entire CE collection	$200
CM Collection:	
1974 Volume	$550
1975 Volume	$450
1976 Volume	$300

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POLICIES AND CHARGES

FOR NON-MEMBERS

1. 50¢ for each microfiche card reproduction (Note: One document may contain more than one microfiche card.)

2. 20¢ per page for photocopy of periodicals and books.

3. 35¢ per page for hardcopy (printout of microfiche) with a limit of 50 pages per request. Larger orders must be approvied by the Research Supervisor and will have special handling charges. These are a $2.50 per hour charge for reproduction time and 50¢ per page over the initial 50 pages. All orders may be subject to a 4-week delivery period. (If requested, SMERC will make available the order form for hardcopy materials from the ERIC Document Reproduction Service, which is able to provide hardcopy at lower costs.)

4. A minimum charge of $3.00 when billing is necessary.

5. Computer Searches

   a. $35 per hour for a "batch" search, i.e. client furnishes descriptors and SMERC does not negotiate, expand or limit the search.

   b. $50 per hour for a negotiated search plus $15 per hour for researcher (personnel) time.

   c. 15¢ per abstracted citation; 10¢ per citation without abstract.

6. $5 per copy for a FIDO catalog; $3 per copy for a Resource Guide. (While the supply lasts.)

7. Search services are provided for non-members only from June 1 to September 1.

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SMERC PUBLICATIONS

Types of Regular Publications

SMERC pursues an active publications program to provide its clients with permanent references on new topics in education. It is our hope that our publications will be regularly read by our clients and that, while they will answer some questions, they will stimulate others in the form of new search requests.

We schedule one publication to appear each month from September through May. All publications are originated, written, and designed by the SMERC research staff, although we encourage your input as to topics you wish to have covered. Our publications fall into three major categories: Collections Catalogs, Resource Guides, and News Notes. (Additional types of publications will be discussed below.) The general publication schedule calls for a News Notes to come out one month, a Collections Catalog or Resource Guide the next month, followed by a News Notes, etc.

COLLECTIONS CATALOGS

FIDO Catalogs (Fugitive Information Data Organizer): FIDO is a collection developed by SMERC to answer its own and its clients' needs. It emphasizes topics of current concern (such as metric education, teaching Vietnamese children), locally produced research and curriculum materials (including individualized instruction packets) and topics of special interest to SMERC's contract areas (California education legislation, accountability). FIDO catalogs are published at irregular intervals and do not cummulate, so each edition should be examined. FIDO documents are identified by order numbers prefaced with the letters "ID", and are available in microfiche format.

Curriculum Materials Catalog: SMERC has been designated as the State Curriculum Depository for all curriculum materials developed by school districts and county school systems in California. SMERC receives these materials from the producing agencies, microfilms them and creates an annual subject-indexed catalog. While it contains little or no research information, the "CM" catalog is an excellent source of practical school information: course descriptions, subject area continuums, and administrative handbooks and models. Document numbers are prefaced with "CM", and are available in microfiche format.

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RESOURCE GUIDES

Several resource guides are published each year by SMERC, each on a topic of current concern. Each guide contains a thorough overview of SMERC's resources on that topic. First published and distributed to clients in paper copy, resource guides are then microfiched to be permanently available. The following is a list of resource guides current available, with publication date and microfiche order number (all with an "ID" preface).

TOPIC	DATE	ID NUMBER
Environmental Education	September 1970	4143
Migrant Education	January 1971	4144
Drug Abuse	January 1971	4145
Year Round Schools	September 1972	4146
Revolution in Education	January 1972	4148
Decentralization	January 1972	4149
Teacher Evaluation	February 1972	4150
Equality in Education	April 1972	4151
Administrator Evaluation	August 1972	4152
Open Classroom	June 1972	4153
Teachers Resources Material Learning Centers	December 1971	4154
Emotionally Disturbed Children	November 1972	4155
Performance Contracts: Education Vouchers	December 1972	4156
Decentralization of Decision Making	January 1973	4157
Early Childhood Education	February 1973	4158
Career Education	March 1973	4159
Negotiations (Meeting and Conferring)	April 1973	4182
Assessment Strategies		4195
Innovation and Change	June 1973	4214
Comparison of Guides to Non-Print Media	November 1973	4373
Individualized Instruction	December 1973	4401
Alternative Schools	January 1974	4439
Mainstreaming	February 1975	4775
Curriculum Guides	1974	4793 (also ED 103 026)
Career Education Catalog (California State Dept. of Education)	January 1975	4715
Bilingual Education and ESL	November 1975	4899
Learning Centers	January 1976	5032

NEWS NOTES

SMERC publishes bi-monthly newsletters containing short articles and lists of new or interesting documents on a wide variety of topics. News Notes also alert you to SMERC's new publications and resources.

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DISTRIBUTION OF REGULAR PUBLICATIONS

At the time of publication, SMERC will send a prearranged quantity of paper copies to the main office of each contract agency--enough so that each school in that area will receive two copies of the publication. (Be sure to notify SMERC if there is a change in the number of your contract schools.) Actual distribution to the schools is the responsibility of the linking agent in that contract.

Since the number of copies printed each time is predicated on current (and some future) contract needs, once the original printing is distributed, we cannot guarantee that additional paper copies will be available to you.

Other SMERC Publications

SPECIAL CATALOGS AND/OR RESOURCE GUIDES

If you would like to have a resource guide on a topic of special concern to your agency, please let us know. If it is a topic of broad interest, we may publish it as a regular resource guide. We will also compile special collections and catalogs for your contract alone, if you wish. This is a special, long-range service which should be negotiated well in advance (perhaps as part of the yearly contract) with SMERC's Director, Dr. Frank Mattas.

BROCHURE

The SMERC brochure is specially designed to introduce new users to our services. We will be happy to send a quantity of these brochures to you for distribution to your schools, or at seminars and conferences.

LINKING LOGS

A new publication, this is an informal, irregular newsletter designed to keep our linking agents abreast of things going on at the SMERC office: personnel changes, publications dates, etc.--a general supplement to regular linking agent/research analyst communications. We also hope that it will serve as an idea exchange between linking agents in the various contracts, a place where problems and successful practices in SMERC field work may be shared and discussed. We encourage linking agents to submit ideas to Linking Logs.

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SUBMITTING DOCUMENTS TO SMERC

SMERC wants and needs locally developed materials for its data banks--it is one way for us to know more about the needs and concerns of our clients and it gives us new ideas to share with others. (Someone in southern California, for example, may be tearing his hair out next month trying to solve a problem that one of your districts tackled years ago. He would appreciate your help, and through SMERC, you can give it very easily.)

Sometimes, in our News Notes or in our transmittal letters with searches, we will request information on a certain topic. Also, by examining our catalogs (FIDO, Unipacs, Curriculum Materials, etc.) you will see the types of information we gather. But don't let this limit you. Please be active in soliciting materials from your local schools and feel free to send us any material that you feel is worth sharing with other educators: documentation on a successful local project, a research study done by the district office, an unusual elective course, a master's thesis--whatever. We will carefully evaluate all that is sent in, if you will please follow the guidelines set out below:

(NOTE: You do not have to separately submit for FIDO anthing that will come to us through other channels as part of our State Curriculum Depository program. The latter materials become CM documents. On COSMOS, CM and FIDO documents will be merged as a single file to search, we we no longer need to have duplications in the two collections.)

GUIDELINES:

FORMAT: Please send in a clean, sharp, original copy. Mimeo, pale xerox copy, dark paper, newspaper print, pencil drawing, and handwriting are not legible in microfiche. 8½ x 11 paper is preferred, because pages larger than that require two microfiche frames to film--and are difficult to read.

AUTHOR RELEASE: If possible, have the author of the document sign a release for the material to come to SMERC. If there is no individual author, you might request a signature from someone who "controls" it, such as the head of the curriculum committee or the district superintendent. You may use copies of the sample release on the following page, or you may make up your own if you choose. Please have the release stapled to the front cover of the document when you send it to SMERC.

SEND A "DISPOSABLE" COPY: We would prefer to keep the copy you send for our files (in case the microfiche is lost), but we will return the copy if necessary. Please be sure to tell us, when you submit a document, if and to whom the copy should be returned.

SUBMISSION TO SMERC: Mail the document to the attention of your research analyst or to Mrs. Katherine Clay.

SMERC's RESPONSE: Once we have received the document, we will evaluate it

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for inclusion in FIDO.* If we decide to accession it, within a few days you will receive a note for the author, thanking them for the contribution and giving the document's order number. If the document itself is to be returned to the author, this will be done later, when the microfiche filming and indexing is complete (See timelines)

TIMELINES: It takes about one month from the time a document is submitted until it is available for ordering as an "ID" microfiche. We can do a "rush" job for one or two special documents, but the time will never be less than a week and a half. Winter is the busy time at SMERC, so things will go smoother and faster if you submit documents in late spring or during the summer, especially if you are sending a large batch.

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*Our other special collections, Unipacs, Learning Centers, etc. are "closed" so every new document we receive, regardless of format, will become a FIDO unless designated for the Curriculum Materials Catalog or for a special catalog you negotiate with SMERC.

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AUTHOR RELEASE FOR FIDO DOCUMENTS

I am sending this document to SMERC with the understanding that it will become part of SMERC's data files. I give my permission for this article to be placed on microfiche and, in the future, copied and distributed at SMERC's discretion.

SIGNED:_____DATE:_____

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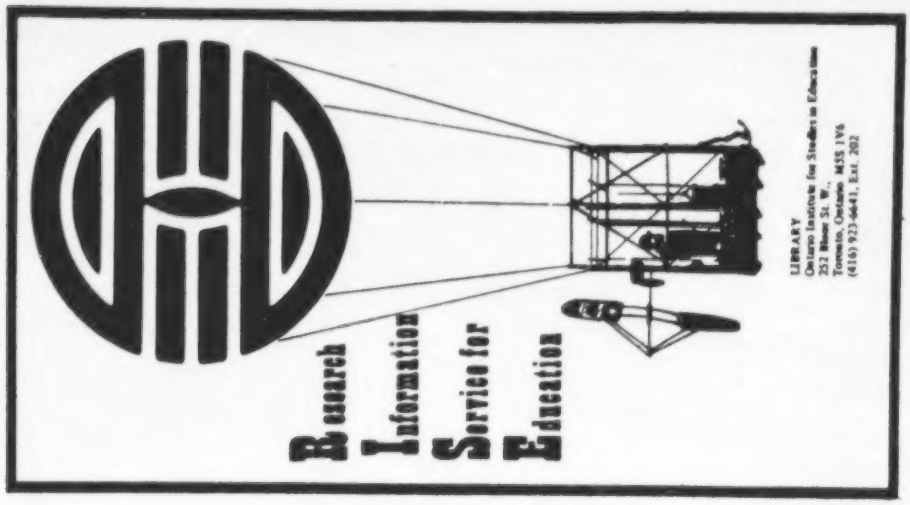
APPENDIX S: Research Information Service for Education (RISE)



RESEARCH INFORMATION SERVICE FOR EDUCATION

Library
The Ontario Institute for Studies in Education
252 Bloor Street West
Toronto, Ontario M5S 1V6
(416)923-6641, Ext. 202)

Request for Literature Search

Date material required: _____

1. Name: _____
   Position: _____
   Address: _____
   _____
   Telephone (day): _____

2. Subject of search (Please be as specific as possible):
   _____
   _____
   Use to be made of material: _____
   _____
   Level (e.g., elementary, secondary): _____

3. Form desired:

Bibliography	☐ Yes	☐ No
Annotated bibliography	☐ Yes	☐ No
Review of the literature	☐ Yes	☐ No
Photocopies	☐ Yes	☐ No

4. Cost:
   Maximum cost acceptable (excluding photocopies): _____
   Maximum cost acceptable for photocopies: _____
   Bill to: Above ☐ Other ☐ Please specify: _____
   _____

Date: _____ Signature: _____

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APPENDIX S (Cont'd.)

What is RISE?

Through its Research Information Service for Education, the Library of the Ontario Institute for Studies in Education offers an extended reference service to the larger educational community on a reimbursable basis. In-depth literature searches are designed and executed by librarians to meet the information needs of individual administrators, school board personnel, teachers, researchers, parents, community groups, and others interested in securing the latest and best information that is available on a specific education-related subject.

What is a RISE literature search?

Literature searches are based on the OISE Library's extensive collection of books, journals, research reports, theses, and ERIC documents. But a RISE search goes beyond the Library to exploit the informal, human educational-information network in Ontario--all in an effort to retrieve information on practices, theories, and research bearing on the issue or problem that a RISE client is currently tackling. This service is especially useful for locating less easily accessible Canadian and local materials. The product of the search as well as the search itself is custom-tailored to each client's specifications, but RISE typically produces an . . .

•Information Package

The results of the literature search are usually forwarded to the client in the form of an "information package"--a bibliography and photocopies of relevant items, as well as directions for procuring books and other materials not suitable for photocopying. Such a "package" may be as comprehensive or as streamlined as the particular client desires. Sometimes a few good articles or a summary of the needed facts, without a bibliography, will suffice. Clients in other situations, however, may prefer not only a list of references, but an . . .

•Annotated Bibliography

Annotations, or abstracts, summarizing the contents of every item listed in the bibliography can be supplied on request. Furthermore, to obtain most efficiently an accurate sense of the trends in the literature on a particular topic, clients may request not only an annotated bibliography, but a . . .

•Review of the Literature

RISE will, if requested, provide a summary description of the literature as a whole--a "review of the literature"--in addition to or instead of an annotated bibliography or "information package."

Costs of RISE

The cost of a RISE literature search depends on the time required in each case. The rate is $12.00 per hour. The charge for photocopying is 20¢ per page, with a $2.00 minimum per order. At the time when the search is arranged, a client may, of course, specify a maximum amount of time to be consumed and a maximum number of pages to be photocopied. At the same time, the librarian may be able to estimate the number of hours that will be required to provide the information needed. Duplicates of bibliographies on file will be supplied at a reduced rate.

Service by Annual Contract

School boards and other organizations may find it convenient to make RISE available to their personnel on demand over an extended period of time. This service can be arranged contractually through RISE.

Topics for RISE Searches

The list of potential topics for RISE literature searches is limited only by a liberal definition of the field of "education." For example:

- The Role of the Teacher in School Decision-Making
- The Optimum Size of Secondary Schools
- Curriculum Materials for Values Education
- Evaluation of Faculty in Universities and Community Colleges
- Death and Children
- Alternative Kindergarten Entry Patterns
- Methods for Teaching Adults

How to Arrange a RISE Literature Search

A search may be arranged by completing the form on the reverse side of this brochure, by writing a letter describing the subject in detail, or by telephoning RISE directly.

For further information, or to arrange a search, please contact:

Linda Corman, Librarian
Research Information Service for Education
OISE Library
252 Bloor Street West
Toronto, Ontario M5S 1V6

(416) 923-6641, Ext. 202